CHERENKO, Ye. S.

"Variations in Growth Characteristics of Different Types of Early-Ripening and Early-Bearing Apples," Dok. v-s Ak. Selkhoz. Nauk, No. 5, 1948.

CHERENKOV, A.

Most important task of Soviet communication workers. Radio no.8: Radio no.8:1-3 Ag '54. (MLRA 7:8)

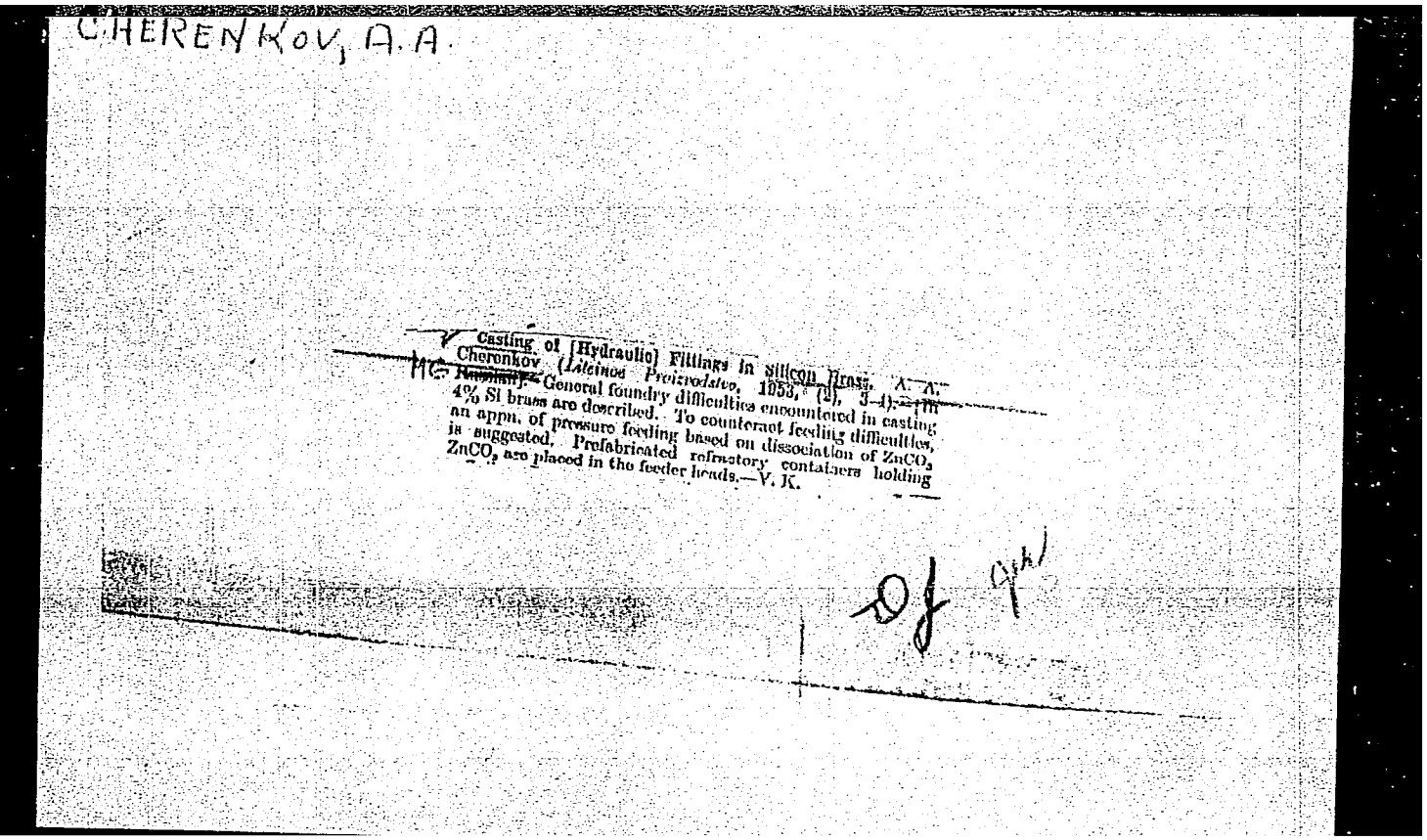
1. Zamestitel' ministra svyazi SSSR.
(Telecommunication--Employees)

CHERENKOV, A.; STAYKOV, St.; TOTTI, Karl Erik; BANSEGI, Ferents (HA5BL)

Victory of the pooled resources of the U.S.S.R. Radio no.12:7-10 D '61. (MIRA 14:12)

1. Ministr svyazi RSFSR (for Cherenkov). 2. Prezident Shvedskoy radiolyubitel'skoy assotsiatsii (for Totti). 3. Chlen TSentral'nogo komiteta Oboronno-sportivnogo soyuza Vengerskoy Narodnoy Respubliki (for Bansegi).

(Radio operators)



CHERENKOV, A.A.

Casting of [Hydraulic] Fittings in Silicon Brass. A. A. Cherenkov (*Liteinoe Proizvodstvo*, 1953, (2), 3–4).—[In Russian.] General foundry difficulties encountered in casting 4% Si brass are described. To counteract feeding difficulties, an appn. of pressure feeding based on dissociation of $ZnCO_3$ is suggested. Prefabricated refractory containers holding $ZnCO_3$ are placed in the feeder heads.—V. K.

AUTHORS: Cherenkov, A.A., Al'tshuler, A.E., Ryzhkova, E.M., Gol'dshteyn, L.D., Shnayder, G.S., Osipov, L.N., and Zhadanovskiy, N.B.

65-6-6/13

TITLE: Hydropurification of sulphurous petroleum products on an industrial installation. (Gidroochistka sernistykh nefteproduktov na promyshlennoy ustanovke).

PERIODICAL: "Khimiya i Tekhnologiya Topliva i Masel" (Chemistry and Technology of Fuels and Lubricants) 1957, No.6, pp.36-41 (USSR).

ABSTRACT: It is expected that hydropurification of sulphurous petroleum products will be widely used in the U.S.S.R. in the near future. On the basis of data on the process obtained by VNII NP and LEN NII, an industrial plant was designed and built by Giproneftezavod on one of the refineries. The plant is described (fig.1). The process is carried out using alumo-cobalt-molybdemum catalyst (developed by VNII NP) and hydrogen (99%), obtained by catalytic conversion of hydrocarbon gases. Straight run distillates and secondary products are being treated to produce Diesel fuel (GOST 4749-49). Plant operating conditions are given in table 1 and the results of purification of straight run distillate from a mixture of Mukhanovskoy, Tuymazinskoy-Devonskoy and Bavlinskoy crude oils, light gas oil from

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Hydropurification of sulphurous petroleum products on an industrial installation. (Cont.) 65-6-6/13

catalytic cracking (from 200-500° fraction) and a 1:1 mixture of the above two distillates in table 2. The degree of desulphurisation 95.2-95.8%. The analysis of gases obtained during hydropurification is given in table 3. The circulating gas before the absorber (with monoethanol-amine) contained 0.7-0.9 volume % of hydrogen sulphide, after the absorber - 0.1%. The mean balance of the products of hydropurification is given in table 4. Hydrogen consumption for straight run distillate was 0.38 wt % and for gas oil from catalytic cracking - 0.71 wt %. Hydrogen used for the reaction was 0.27% and 0.60% respectively. The sulphur balance is given in table 5. Up to 0.03% of H_2S calculated on the raw material used is carried out with treated fuel and is removed by washing with 2.5 - 4% NaOH solution. The alkali consumption 0.1 kg per ton of Diesel fuel. The working period of the catalyst without regeneration is 8000 hrs. The regeneration of the catalyst is carried out at a temperature not exceeding 550° under 40 atm. pressure with a mixture of an inert gas with air. Initial oxygen concentration 0.2 - 0.25 vol % and at the end of the regenerating period is increased to 1.4%. When the main

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Hydropurification of sulphurous petroleum products on an industrial installation. (Cont.) 65-6-6/13

part of the "coke" was burned out, the remaining part was removed by increasing oxygen concentration to 2% and preheating the gas to 520-550 C (2 hours). Total duration of the regeneration process 20 hours. The initial activity of the catalyst is completely restored. When the plant was stopped for inspection it was found that the upper layer of the catalyst was covered with iron sulphide. Accumulations of iron sulphide were found in various places, i.e., the corrosion of the apparatus was noticeable. The parts of the apparatus containing H_2S and H_2 at high temperatures were made from steel X5M, the remaining part from mild steel. Apparently the corrosion resistance of X5M steel was insufficient. The precipitation of iron sulphide on the catalyst has no apparent influence on its activity. There are 5 tables and 1 figure.

ASSOCIATION: VNII NP; Orgneft).

AVAILABLE:
Card 3/3

CHERENKOV, A.P.

Passing of quasi-normal fluctuations through a detector with a low-frequency filter. Vest.Mosk.un.Ser.mat., mekh., astron., fiz., khim. 12 no.3 '57. (MIRA 11:3)
p125-127

1.Kafedra kolebaniy Moskovskogo gosudarstvennogo universiteta.
(Radio detectors) (Radio filters)

BARK, L.S.; BOL'SHEV, L.N.; KUZNETSOV, P.I.; CHERENKOV, A.P.; DITKIN, V.A., prof., otv. red.; ORLOVA, I.A., red.

[Rayleigh-Rice tables of distribution] Tablitsy raspredeleniia Relaia-Raisa. Moskva, Vychislitel'nyi tsentr, 1964. 245 p. (MIRA 18:1)

ACCESSION NR: AP4039634 S/0052/64/009/002/0303/0317

AUTHOR: Cherenkov, A. P., (Moscow)

TITLE: Control with small random perturbations by means of single switching

SOURCE: Teoriya veroyatnostey i yeye primeneniya, v. 9, no. 2, 1964, 303-317

TOPIC TAGS: random perturbation, switching theory, optimal control

ABSTRACT: Let $x = \{x_1, \ldots, x_m\}$ be a vector of phase coordinates, $\varepsilon = \{\varepsilon_1, \ldots, \varepsilon_n\}$ a vector of random variables disturbing the motion of the system, f a vector function, and

$$f(t, x, \varepsilon) = \begin{cases} f^1(x, \varepsilon) \text{ for } 0 \leqslant t < \tau, \\ f^2(x, \varepsilon) \text{ for } t > \tau. \end{cases} \quad (1)$$

The given system is described by the differential equation

$$\dot{x} = f(t, x, \varepsilon), \ t > 0, \quad (2)$$

and the initial state of the system is

$$x(0, \varepsilon) = x^0, \quad (3)$$

and for $t = \tau$ the functions $f_i(x, \varepsilon)$ may have discontinuities only of the first

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kind. τ is said to be the moment of switching. Given the functional

$$V[x(\tau+t,\varepsilon),\ t>0]. \tag{4}$$

The author assumes that with no perturbations, that is, $\varepsilon = 0$, the solution of (2) subject to (3) exists, where the motion of the phase point x is completely known. The moment of switching $\tau = \tau^0$ and the value of the functional

$$V[x(\tau^0+t,0)] = V^0 \tag{5}$$

are given. The author treats the problem of choosing τ to minimize the variance of the functional V. The switching time can depend on the past, but not on the future. Consideration is restricted to solutions d(t) which depend only on the given choice of functions $u(t,\varepsilon) = \{u_1(t,\varepsilon),\ldots,u_s(t,\varepsilon)\}$. Concretely,

$$d(t) = d(\phi(u)), \tag{6}$$

where $\phi(u)$ is a scalar function, and if

$$\phi(u) < C = \phi(u(\tau^0,0)), \tag{7}$$

then switching does not occur, while the equality

$$\phi(u) = C \tag{8}$$

is a switching signal. The function $\phi(u)$ is called a characterizing function, and the functions $u_k(t,\varepsilon)$ its components. Switching occurs when the characterizing function takes on a given value. Let

$$\eta(t,\varepsilon) = \phi(u(t,\varepsilon)). \qquad (9)$$

The case $\eta(t,\varepsilon) \equiv t$ corresponds to absence of the considered control. The author studies the problem of optimal finding of a characterizing function with computation of only the principal terms with respect to perturbations. As $\phi(u)$ it is sufficient to consider only linear combinations.

$$\phi(u) = (\Phi, u). \qquad (10)$$

For determining optimal coefficients $\Phi_1,\ldots,\Phi_s$ and the corresponding value of the variance V, the author uses an inhomogeneous system of linear algebraic equations. He studies the problems of existence and uniqueness of the solution and equality to zero of V, giving an example. Orig. art. has: 80 formulas.

ASSOCIATION: none

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000308410007-8"

ACCESSION NR: AP4039634

SUBMITTED: 05Feb63 DATE ACQ: 19Jun64 ENCL: 00

SUB CODE: MA NO REF SOV: 003 OTHER: 000

Card 4/4

L 40326-65

ACCESSION NR: AP4045054 S/0052/64/009/003/0539/0541

AUTHOR: Cherenkov, A. P.

TITLE: One problem of a parametric control of small random perturbations

SOURCE: Teoriya veroyatnostey i yeye primeneniya, v. 9, no. 3, 1964, 539-541

TOPIC TAGS: parametric control, small random perturbation, functional dispersion

ABSTRACT: The author discussed in a previous paper (Teoriya veroyetnostey i eye primeneniya IX, 2 (1964), 303-317) the control, at small perturbations, by means of single switching. In the present paper, he considers a related problem. The probability criterion for the perturbation of the system is given by the dispersion of the given functional. In the previous paper, the control was realized by regulating the switching time τ, whereas in the present paper τ is fixed, and the control is accomplished by a parameter the value of which depends on a function η at $t = \tau$. Theorems are obtained in this way which are similar to those obtained in the previous work. Orig. art. has: 7 equations.

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L 40326-65
ACCESSION NR: AP4045054

ASSOCIATION: None

SUBMITTED: 11Jan64 ENCL: 00 SUB CODE: MA

NR REF SOV: 001 OTHER: 000

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CHERENKOV, V. V.

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Card 1/ 7 COLLEGIUM DISCUSSES COMMUNICATIONS OPERATIONS

COLLEGIUM DISCUSSES COMMUNICATIONS OPERATIONS -- Moscow, Vestnik Svyazi, No 3, Mar 57

Speaking at a recent meeting of the Collegium of the Ministry of Communications USSR, N. D. Psurtsev, Minister of Communications USSR, stated that the experience of 2 years' operation has affirmed the correctness of reorganizing the administration of communications organs and creating ministries of communications in union republics. However, work must continue on improving the structure of communications organs and making the functions of the Ministry of Communications USSR and union-republic ministries of communications more precise, taking practical experience into account, in order to improve cooperation with each other. Staff norms for engineering and technical workers in a number of communications branches and enterprises have fallen. Technicians could be used successfully in many positions instead of engineers, while qualified linemen could then replace technicians. The possibility of transferring intrarayon communications and wired radio lines to technical line centers, as was done in the Soviet Baltic republics, should be considered for other republics.

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The minister then spoke of the necessity of developing communications facilities further by fuller utilization of internal reserves and proper organization of construction. In this area, a great deal of bad management and wastefulness, which often start in the planning stage, is tolerated. Branch administrations of the Ministry of Communications USSR formulate plan assignments unsatisfactorily. The construction work of union-republic ministries of communications is still being carried out poorly. In preparing the 1957 plan, a tendency toward scattering funds was noted, particularly in the Ukrainian SSR and several other republics. It is necessary that new construction equipment be introduced more rapidly and the mechanization of construction work, particularly finishing operations, be raised.

Paurtsev devoted a great deal of time to further technical progress in the communications system. In 1957, twice as many funds will be allocated for the development and introduction of new equipment as in 1955. Over 200 developments have been included in the plan. The main task now is to speed up completion of developments and to provide for their introduction on a wide scale in structures under construction and in existing communications enterprises.

COLLEGIUM DISCUSSES COMMUNICATIONS OPERATIONS

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Having underscored the importance of training and correct placement of personnel, the minister stated that particular attention must be devoted to strengthening the staffs of postal enterprises and rayon communications offices.

In conclusion, Psurtsev stated that the 1957 plan can only be fulfilled by making wide use of internal reserves, increasing labor productivity, and developing socialist competition. The cooperation of communications workers in controlling production and improving the organization of labor in communications enterprises must be expanded in every possible way.

A. V. Cherenkov, Minister of Communications RSFSR, noted that considerable funds are allocated in the local budget of the RSFSR for constructing television centers and radio relay lines. However, the Main Administration of Material and Technical Supply and the Main Radio Administration of the Ministry of Communications USSR are not sufficiently concerned with providing equipment. The Ministry of Communications USSR

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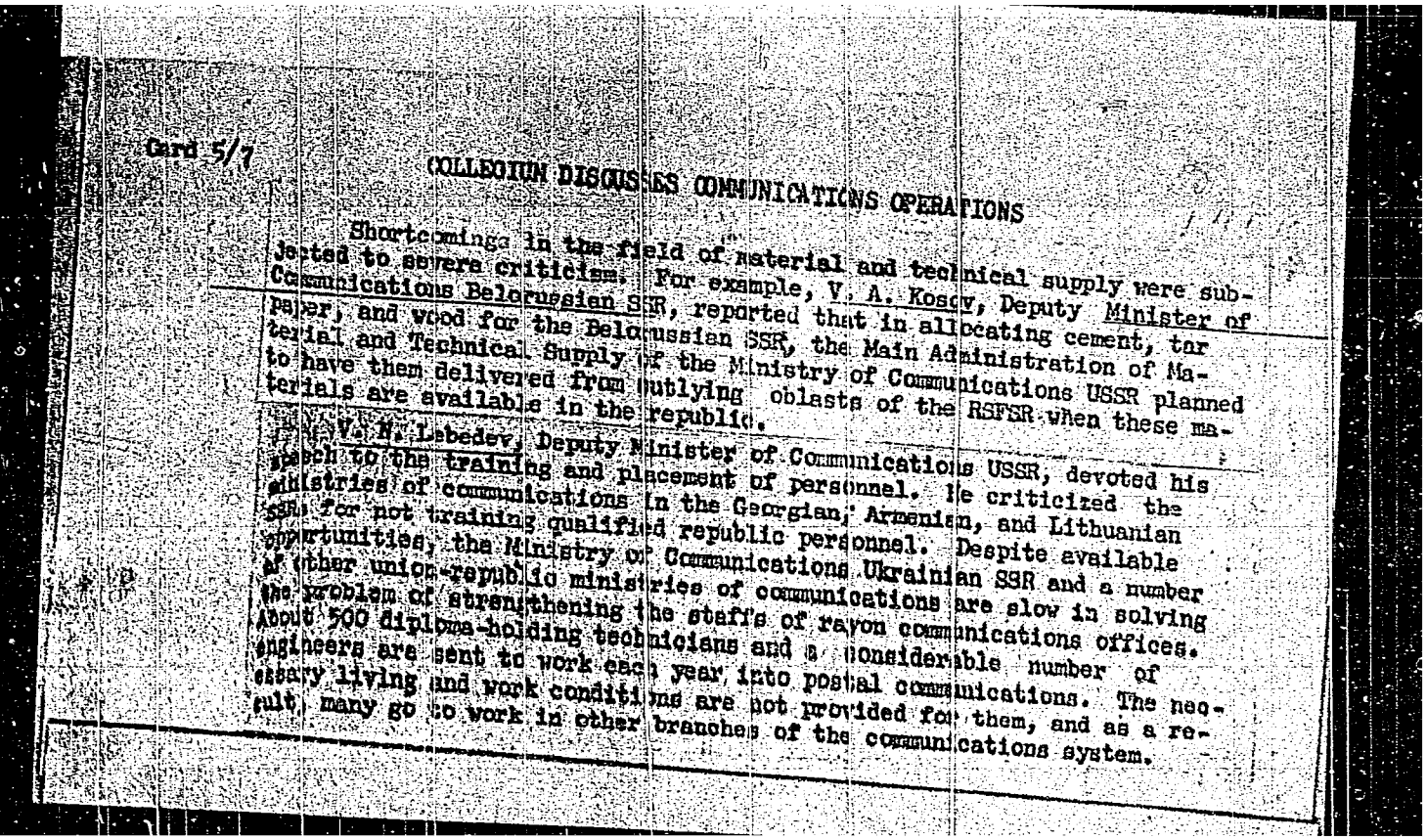
COLLEGIUM DISCUSSES COMMUNICATIONS OPERATIONS

does not make timely examination of plans presented for its approval. The construction of many important structures has been lagging for a long time because of incorrect planning and delivery of supplies. Several branch administrations of the ministry sometimes bypass union-republic ministries of communications and interfere with the activity of communications enterprises.

A. F. Aleksandrov, Minister of Communications Latvian SSR, took note of the extreme detail in plans being developed by the Planning and Financial Administration of the Ministry of Communications USSR for union republics.

I. M. [illegible], Minister of Communications Lithuanian SSR, [illegible] that despite the [illegible] in staff and accounting [illegible], ministries of communications and communications administrations and enterprises in union republics are still devoting a great deal of time to completing different forms and tables, to the detriment of their work on directing production. Work plans which are received by union-republic ministries of communications do not take seasonal influences and various other local peculiarities into account. It is necessary that the Ministry of Communications USSR present only annual work plans and union-republic ministers of communications be given the right to make necessary changes in them quarterly.



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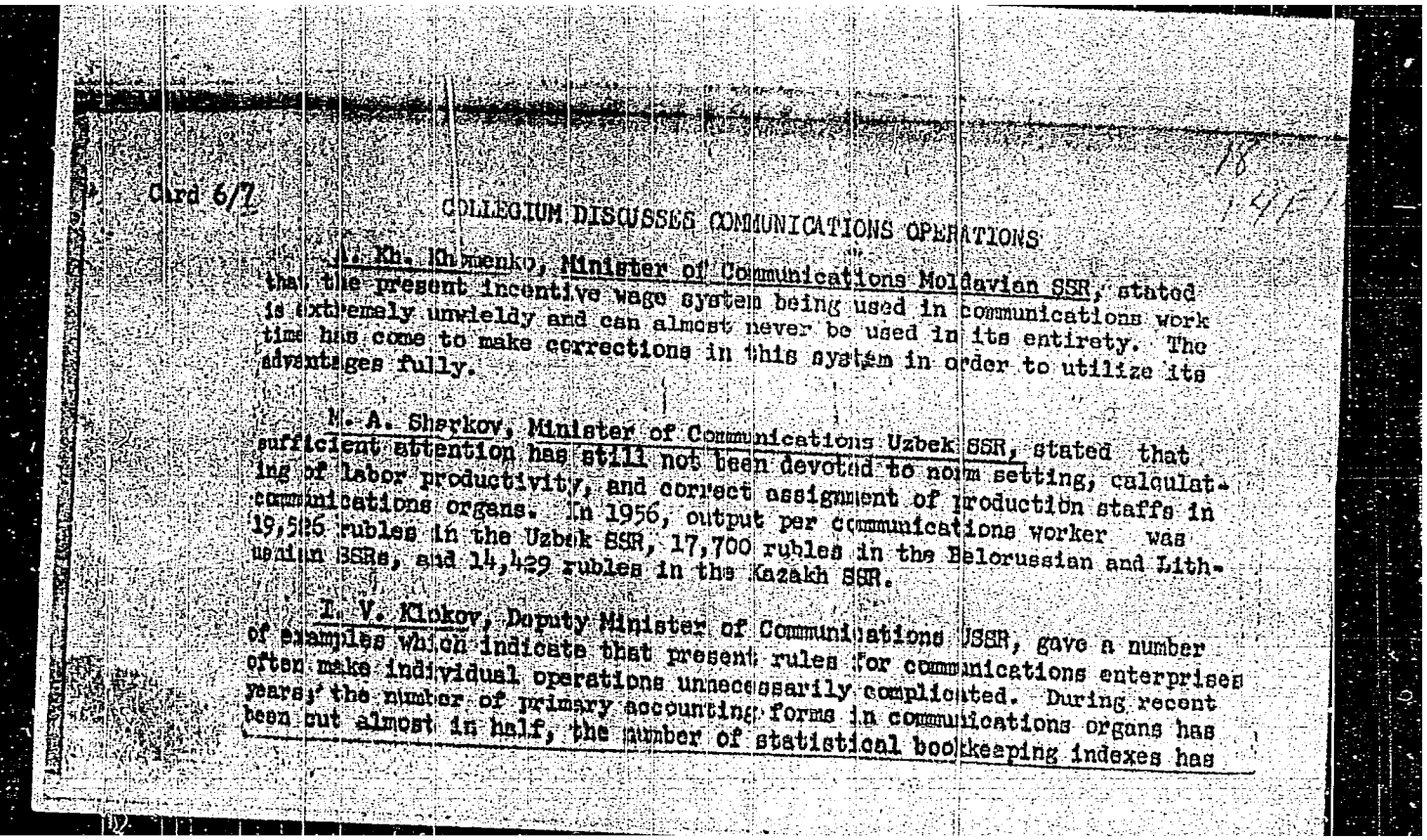
COLLEGIUM DISCUSSES COMMUNICATIONS OPERATIONS

Shortcomings in the field of material and technical supply were subjected to severe criticism. For example, V. A. Kosov, Deputy Minister of Communications Belorussian SSR, reported that in allocating cement, tar paper, and wood for the Belorussian SSR, the Main Administration of Material and Technical Supply of the Ministry of Communications USSR planned to have them delivered from outlying oblasts of the RSFSR when these materials are available in the republic.

V. M. Lebedev, Deputy Minister of Communications USSR, devoted his speech to the training and placement of personnel. He criticized the ministries of communications in the Georgian, Armenian, and Lithuanian SSR's for not training qualified republic personnel. Despite available opportunities, the Ministry of Communications Ukrainian SSR and a number of other union-republic ministries of communications are slow in solving the problem of strengthening the staffs of rayon communications offices. About 500 diploma-holding technicians and a considerable number of engineers are sent to work each year into postal communications. The necessary living and work conditions are not provided for them, and as a result, many go to work in other branches of the communications system.



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COLLEGIUM DISCUSSES COMMUNICATIONS OPERATIONS

I. Kh. Ikhmenko, Minister of Communications Moldavian SSR, stated that the present incentive wage system being used in communications work is extremely unwieldy and can almost never be used in its entirety. The time has come to make corrections in this system in order to utilize its advantages fully.

M. A. Sharkov, Minister of Communications Uzbek SSR, stated that sufficient attention has still not been devoted to norm setting, calculating of labor productivity, and correct assignment of production staffs in communications organs. In 1956, output per communications worker was 19,526 rubles in the Uzbek SSR, 17,700 rubles in the Belorussian and Lithuanian SSRs, and 14,429 rubles in the Kazakh SSR.

I. V. Klokov, Deputy Minister of Communications USSR, gave a number of examples which indicate that present rules for communications enterprises often make individual operations unnecessarily complicated. During recent years, the number of primary accounting forms in communications organs has been cut almost in half, the number of statistical bookkeeping indexes has

COLLEGIUM DISCUSSES COMMUNICATIONS OPERATION

been reduced to one seventh the previous number, and the number of indexes in the basic activity plan of communications administrations and offices has been reduced to one sixth the previous number. However, much more remains to be done in this area.

The collegium devoted considerable attention to problems of housing construction. During the Sixth Five-Year Plan, three times as much living space must be provided for communications workers as during the Fifth Five-Year Plan. The cost of construction must be lowered, its quality raised, and the initiative of communications workers used more widely for construction work. A. T. Tsivun, Deputy Minister of Communications Ukrainian SSR, spoke of the experience of communications workers in Kiev who are taking active part in the construction of living quarters. Within a year, 1,500-2,000 communications workers and their families will receive well-built apartments in these quarters. In the Kazakh SSR, construction of houses with one or two apartments has been organized using local materials. In the city of Molodechno, Belorussian SSR, local resources were mobilized to build a 40-room dormitory for communications workers that will be put into use in 1957.

6(4,6,7) SOV/111-59-6-13/32

AUTHOR: Cherenkov, A. V., Minister of Communications of the RSFSR

TITLE: The Seven-Year Plan of Communication-Means Development in the RSFSR

PERIODICAL: Vestnik svyazi, 1959, Nr 6, pp 14-17 (USSR)

ABSTRACT: The author makes a general review of the present state of communication means in the RSFSR, and of the planned development. The stress will be put on the development of communication means in the regions of Siberia, Far East, and North, for which 42% of the total capital investment has been assigned by the RSFSR Ministry of Communications. The increase of transportation means and the large-scale introduction of automatic equipment will make it possible to improve the work efficiency by 25-30%. During the 7-year period, the postal service will be modernized and mechanized; 5,000 post offices will be founded including 3,150 in rural areas; 72,000

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mail boxes will be installed including 60,000 in rural areas; mail points will be founded in all larger populated places which are more than 5 km from a post office; 36 post offices and a number of post-exchange points will be built at RR stations. To speed up mail delivery, the RR stock will be increased to 400 mail cars; special containers will be used for mail transport; the use of motorcycles, motor-scooters, and bicycles will be expanded; the number of water-navigation units will be increased up to 900; the departmental motor-pools will be considerably expanded, and airplanes and helicopters will be used. A total of 100 aerosleds will be used in roadless areas, and 10 of them (of Kamov design) will be delivered this year. To facilitate the work of mailmen, mailbox boards will be installed in the entrances of large houses. As to the internal rayon telephone communications, there were 11,000 kolkhoz offices and as many post offices yet without a telephone at the beginning of this year. By 1963, they all will be provided with telephones, and more than

40% of the manual village telephone stations will be replaced by automatic ones. Many semi-automatic "UPTS" stations will be installed. By the end of the 7-year plan, 75% of the "VRS" telephone stations will be working round the clock (compared with 39% at the beginning of 1959). It is planned to add the second wire to 61,000 km of single-wire telephone lines before 1962. Telephones must be installed in 2,300 kolkhozes and 1,500 post offices this year. It was planned to use non-metallic coating for the underground cable lines of the "VRS", but the Tekhnicheskoye upravleniye (Technical Administration) and the UTRES of the USSR Ministry of Communications have done little, and no sealing systems have even been developed. Telephone communication between the kolkhozes and their "brigady" (teams) and farms must be provided, but there is no cable with polyvinyl-chloride insulation and no equipment for such stations. More than 10,000 automatic offices with 200,000 numbers and 600,000 km of "PRVPM" cable are needed for the internal telephone lines of

the largest kolkhozes (25 to 30% of all kolkhozes). To achieve this, it is necessary to increase sharply the production of small-capacity automatic offices "ATS" with low current consumption, and of cable with non-metallic coating. It is clear that this will be possible only in the last years of the 7-Year Plan. The urban telephone stations will be automated to 70%, and 530,000 new numbers will be added by the end of the 7-Year Plan. The automatic stations, "ATS", will be first built in the centers of Republics, oblast's, and krays, where manual stations are now operating: Omsk, Kemerovo, Barnaul, Kursk, Orenburg, Magadan; and then in Kaluga, Ordzhonikidze, Yakutsk, Novgorod, Pskov, Vologda, Petropavlovsk-na-Kamchatke, Blagovesh-chensk, Elista, Syktyvkar, Cheboksary, and other towns. Larger industrial towns will also get "ATS", including Cherepovets, Podol'sk, Taganrog, Syzran', Elektrostal', Nizhniy Tagil, Stalinsk, Orsk, Prokop'yevsk, Noril'sk, and Angarsk. The telephone networks will be expanded in Moscow, Leningrad, Sverdlovsk, Novosibirsk, Perm',

Kirov, Gorkiy, Kazan', Voronezh, Stalingrad, Saratov, Krasnoyarsk, Khabarovsk, and Vladivostok. The capacity of "ATS" will be increased in Kislovodsk and Sochi. New offices will be installed in the resorts Mineral'nyye Vody, Yessentuki, and Anapa. The number of coin-box telephones will be increased to 18,000. The plan also provides for the introduction of the "ATS" crossbar system. To cut the expenses, dial intercommunication systems ("domovaya ATS") requiring 50% less cable, frequency-division multiplex of the trunks, bridge-type amplifiers and blocking devices will be used. The worn and obsolete "MB"-system telephone equipment at the rayon centers (about 150,000 extensions) will be replaced by "TsB" and "ATS", and their capacity will be increased by 100,000 extensions. The planned development will not completely satisfy the needs, and the initiative of the local organizations will be needed to find additional funds. The Moscow and Leningrad town Soviets are an example - they found the funds to double the planned capacity of the telephone stations

in 1957 and 1958. All administrative and large-industry centers will have round-the-clock communication with Moscow, and the most important of them will have, as a rule, a "no-delay" service. The number of rayon centers that have a round-the-clock telephone communication with the republic, kray, or oblast' center towns was 56.7% of the existing centers at the beginning of 1959, and by 1965 it will be 75 or 80%. The Sovnarkhozes will have a day-and-night communication with most enterprizes of their regions. The telegraph and the photo-telegraph exchange network will be expanded. The relay of through telegrams will be automated in the main telegraph stations of the RSFSR. The number of intertown telephone channels will be increased to about 1.2 million channel-kilometers by the construction of comparably-short radio-relay and cable lines, as well as by multiplexing the existing aerial network and the suspension of bimetallic circuits in lieu of steel ones. The use of short radio-relay and cable lines branching off the trunks will be introduced first in the Moskovskaya,

Sverdlovskaya, Kemerovskaya, and Gor'kovskaya oblast'. Further, it is planned to: increase the capacity of intercity telephone offices by 5,000 channels; install semiautomatic equipment on 1,400 intercity channels (15% of the total); increase the telegraph network by 625,000 channel-kilometers and the number of telegraph extensions by 5,000. A total of 203 photo-telegraphic lines will be put into service. The radiofication of the rural areas must be completed in 1961, at which time the number of "provodnaya radiotranslyatsionnaya tochka" (wire rediffusion points) in the RSFSR will reach 22 million. To achieve this, the number of wire rediffusion points must be increased by 3.7 million. The "DRTS", "SMUR", and "LTU" will be equipped with automotive cranes, pole-setting machines, trucks, and other machinery. This year, 15 automotive cranes and more than 50 pole-setting machines will be delivered. To improve the reception of radio broadcasting, a number of radio stations will be rebuilt, and new ones erected. A two-program uhf broadcasting schedule is planned.

The Seven-Year Plan of Communication-Means Development in the RSFSR

In this year, 13 "UKV ChM" (uhf FM) transmitters will be put into service out of the 130 planned by 1965. One-program TV will be provided for the most densely-populated regions of the European RSFSR, and for the largest towns and their surroundings in Siberia and Far East. Already, the Moscow TV program is being relayed by 9 oblast' towns, and the number of spectators is 8-10 million. The Moscow TV program is being telecast by the "Tsentral'naya studiya televideniya" (Central TV Studio). During the past year, 25 TV centers and relay stations were put into operation, and the TV relay line, Moscow - Smolensk, was completed. There are now 45 TV centers and powerful relay stations in the RSFSR, not only in the center regions but also in the Far North (Murmansk, Vorkuta), in the Far East (Vladivostok), in the South (Krasnodar, Sochi), and the Extreme West (Kaliningrad). There will be 12 TV centers and relay stations installed this year; seven of these are already in operation, among others in Ufa, Petrozavodsk, Noril'sk, and Sochi. A total of 36 TV centers

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The Seven-Year Plan of Communication-Means Development in the RSFSR

and relay stations is planned to be erected by 1965. There are 4 photos.

ASSOCIATION: Ministerstvo svyazi RSFSR (RSFSR Ministry of Communications)

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CHERENKOV, A.V.

Use all means to raise quality and efficiency in the operation of communication agencies. Vest. sviazi 20 no.5:24-28 My '60. (MIRA 13:12)

1. Ministr svyazi RSFSR (Telecommunication)

Cherenkov, I.I.

CHERENKOV, I.I.

Paint grinder with a movable upper millstone. Rats.i izobr. predl. v stroi. no.105:3-5 '54. (MLRA 8:10)
(Paint machinery)

CHERNENKOV, I.I.

Knife for cutting linoleum and lincrusta. [Suggested by I.I.Cherenkov.] Rats.i izobr.predl.v stroi. no.144:21-22 '56. (MLRA 10:2)
(Linoleum)

BARATOV, R.; CHERENKOV, I.N.

Problems of the coordination of geological research in Tajikistan. Izv. Otd. est. nauk AN Tadzh.SSR no.17:143-144 '56. (MIRA 11:8)
(Tajikistan--Geological research--Congresses)

KUKHTIKOV, M.M.; SALTOVSKAYA, V.D.; CHERENKOV, I.N.

Stratigraphy of Paleozoic terrigenous deposits in the central part of the Zeravshanskiyand Gissar Ranges. Dokl. AN Tadzh. SSR no. 22:3-8 '57. (MIRA 11:7)

1. Institut geologii AN Tadzhikskoy SSR. Predstavleno akademikom AN Tadzhikskoy SSR A.P.Nedzvetskim.
(Zeravshanskiy Range--Geology, Stratigraphic)
(Gissar Range--Geology, Stratigraphic)

KUKHTIKOV, M.M.; SALTOVSKAYA, V.D.; CHERENKOV, I.N.

New data on the geology and Carboniferous sediments of the southern slope of the Chumkar-Tau (western extremity of the Tunkestan Range). Trudy AN Tadzh.SSR 104 no.1:95-100 '59. (MIRA 15:4)

1. Institut geologii AN Tadzhikskoy SSR.
(Turkestan Range--Geology)

KUKHTIKOV, M.M.; CHERNIKOV, I.N.

"Cambrian" sediments of the northern slope of the Turkestan Range. Dokl. AN Tadzh. SSR 3 no.1:3-6 '60. (MIRA 13:12)

1. Institut geologii Akademii nauk Tadzhikskoy SSR. Predstavleno chlenom-korrespondentom AN Tadzhikskoy SSR R.B.Baratovym.
(Turkestan Range--Geology, Stratigraphic)

CHERENKOV, I.N.

Upper Paleozoic flysch in the Kshemysh and Karavshin Basin (northern slope of the Turke-tan Range). Trudy Inst. geol. AN Tadzh. SSR 7:30-49 '63. (MIRA 17:6)

CHERENKOV, I.N.

Cavings and landslides in the flysch sediments of the Karavshin basin. Lit. i pol. iskop. no.6:112-115 N-D '64.

(MIRA 18:3)

1. Institut geologii AN Tadzhikskoy SSR, Dushanbe.

SERENKO, Igor' Aleksandrovich; LIFSHITS, Dmitriy Yefimovich; CHERENKOV, Nikolay Grigor'yevich; SHANDIN, S.N., red.; ISAYEVA, V.V., [illegible] red.; POLOSINA, A.S., tekhn.red.

[Drilling slim and reduced diameter wells] Bureniie skvazhin umen'shennykh i malykh diametrov. Moskva, Izd-vo "Nedra," 1964. 275 p. (MIRA 17:3)

CHERENKOV, N.N.

Some work results of the Institute of Geology of the Academy of Sciences of the Tajik S.S.R. in 1958. Izv. Otd. est. nauk AN Tadzh. SSR no.3:147-148 '59. (MIRA 15:5)
(Tajikistan--Geological research)

L 46158-65 EWT(m)/EPA(w)-2/EWA(m)-2 Pt-7/Pab-10 IJP(c) OS

ACCESSION NR: AT5007923 S/0000/64/000/000/0355/0357

AUTHOR: Ado, Yu. M.; Belovintsev, K. A.; Belyak, A. Ya.; Bessonov, Ya. G.; Dem'yanovskiy, O. B.; Skorik, V. A.; Cherenkov, P. A.; Shirchenko, V. S.

TITLE: Storage of particles in a synchrotron

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 355-357

TOPIC TAGS: high energy accelerator, charged particle beam, particle physics, synchrotron

ABSTRACT: Synchrotron-type accelerators of several 100 Mev and higher can be employed for particle storage [Yu. M. Ado, "Atomnaya Energiya, 12, 54 (1962)]. In the case of simultaneous storage of electrons and positrons in an accelerator, one can obtain colliding electron-positron beams. In order for a synchrotron to operate in the storage state, the constant component of the driving magnetic field must be larger than the amplitude of the variable component. In particular, if the variable component is a sinusoidal function of time, the driving magnetic field H must have a specified shape. In this case, the accelerating hf potential is step-shaped.

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i.e. remains switched on continuously in contrast to the synchrotron's operation in the usual state. The injection of particles is effected at moments of time t_1, t_2, t_3,..., which correspond to intersections of the ascending curve H-versus-t with the constant ordinate H_1. The particles captured in the synchrotron state of the storage device, which are accelerated during the rising portion of the magnetic field H and slowed down when the magnetic field is decreasing, remain in the accelerator chamber for a period that is determined mainly by the scattering processes and by the bremsstrahlung on the atoms of the residual gas. During each period of the driving magnetic field H close to maximum H there exists considerable radiation damping of the amplitudes of betatron and synchrotron oscillations. As a result, the phase volume occupied by the particles decreases. This permits the onset of amplitude modulation of the specified hf-potential without loss of the particles captured earlier. In this case, the injection of particles will proceed into the phase space between the separatrices which are defined by the amplitudes of hf-potential U (maximum step value) and $U - \Delta U$ (modulation decrement due to H being less than H_1 for the brief periods just before t_1, t_2, t_3,...). The admissible depth of modulation ΔH is larger the larger the magnitude of radiation damping of the oscillations. The effectiveness of the injection into the synchrotron state of storage during onset of amplitude modulation of the hf-potential is ten times the effectiveness of injection directly into the steady-state separatrix. In the case

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of particle storage in a synchrotron, injection is effected into the variable magnetic field during the low energy of the injected particles which is typical for the given accelerator. Consequently the problem of particle injection is essentially simplified in comparison with injection into storage rings. Moreover, the small injection energy simplifies the problem of obtaining positrons. These properties permit attainment of a comparatively high rate of storage and thus a lowering of the requirements made on the degree of vacuum. To verify the possibility in principle of realizing the method of particle storage in a synchrotron, experiments were carried out on a 280-Mev synchrotron under specific conditions of particle energy (170 Mev for maximum $\dot{H}$ and 7 Mev for minimum $\dot{H}$), amplitude U, of hf-potential (1.8 kv), modulation depth ΔU (0.36 kv), rate of growth of driving magnetic field at moment of injection ($1.5 \cdot 10^5$ oersteds/sec), pressure of residual gas in vacuum chamber ($5 \cdot 10^{-6}$ mm/Hg). The source of electrons is an 8-Mev microtron [K. A. Belovintsev, A. Ya. Belyak, A. M. Gromov, Ye. M. Moroz, P. A. Cherenkov, "Atomnaya Energiya, 14, 359 (1963)]. Finally as shown by tests conducted on electron storage in a synchrotron, it is possible to carry out simultaneous storage of both electrons and positrons in quantities sufficient for setting up experiments on colliding beams if the pressure in the vacuum chamber is lowered to 10^{-9} mm/Hg and the conditions for particle capture are suitably improved. Orig. art. has 4 figures.

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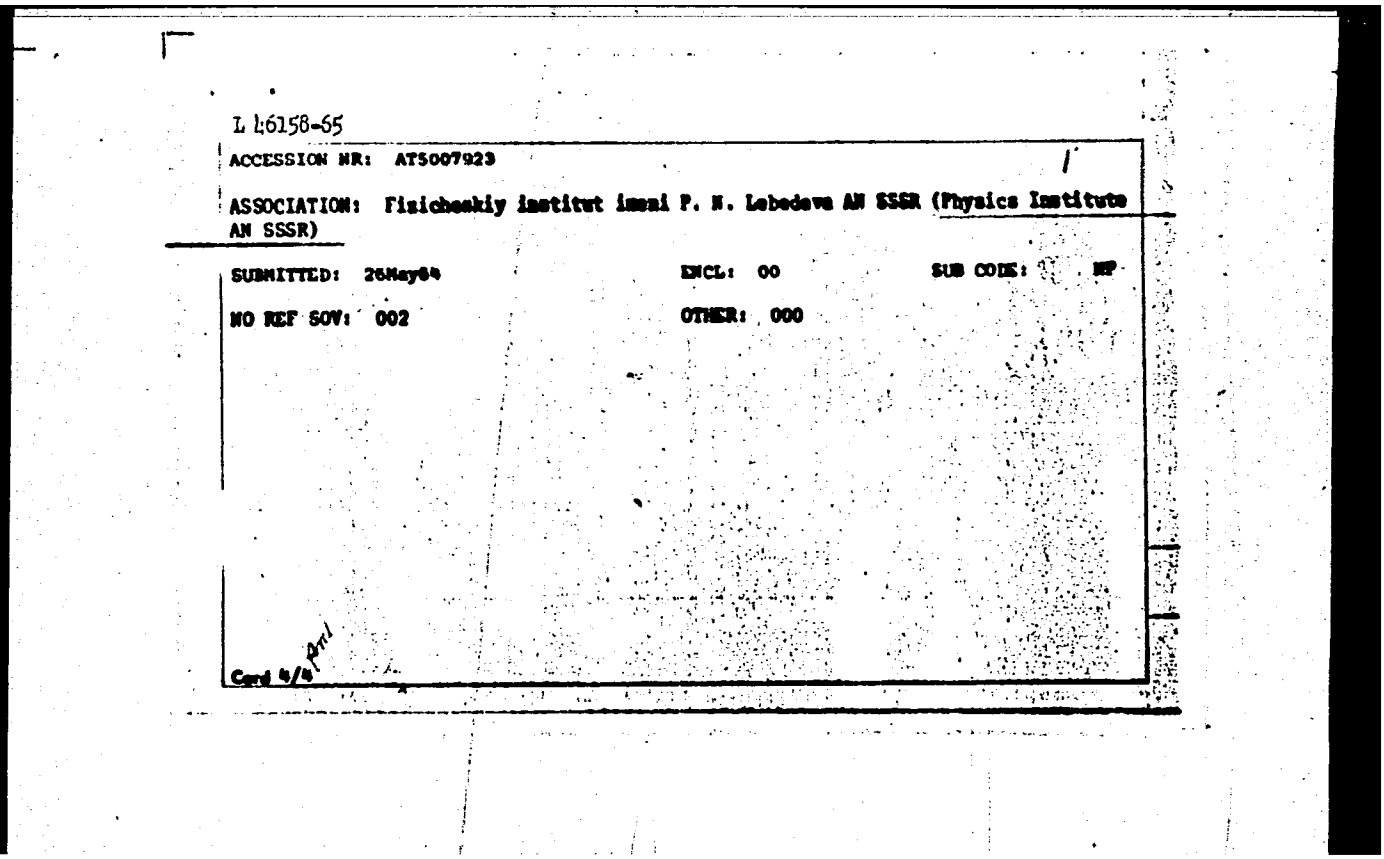

L 46158-65

ACCESSION NR: AT5007923

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute AN SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: NP

NO REF SOV: 002 OTHER: 000

Card 4/4 pnl

ADO, Yu.M.; BESSONOV, Ye.G.; CHERENKOV, P.A.

Experiments on electron accumulation in a synchrotron. Atom. energ. 18 no.2:104-107 F '65. (MIRA 18:3)

L 4236-66 EWT(m)/EPA(w)-2/EWA(m)-2 IJP(c) GS

ACCESSION NR: AT5007978 S/0000/64/000/000/1061/1064

25
22
B+1

AUTHOR: Belovintsev, K. A.; Cherenkov, P. A.

TITLE: Positron microtron 19

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 1061-1064

TOPIC TAGS: high energy accelerator, positron, electron positron pair, storage device

ABSTRACT: The enhanced interest which has been recently shown by wide circles of physicists in the various ideas of particle storage is based mainly upon the tremendous possibilities which have been uncovered by the realization of collisions of electron-positron beams. Detailed study of the problem of storage shows that the principal cause of the large number of technical difficulties which have arisen during the development of this or another scheme of electron-positron storage device is the absence in nature of sufficiently powerful sources of positrons. The standard schemes for obtaining positron beams for storage rings of the types: electron beam of synchrotron → gamma-quantum beam → e^+ from accumulator target and electron beam from linear accelerator → e^+ from accumulator target give comparative-

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ly lower coefficients of conservation for given interval of angles and energies that are determined by the design of the storage device. Thus the initial beam of electrons must possess energies at least equal to the energy of the accumulator storage device. Extensive approaches to progress in storage techniques were opened in connection with the development of the idea of the conversion of any synchrotron into a storage device, which was proposed in 1961 by Yu. M. Ado (*Atomnaya energiya* 12, 54 (1962). Here one drops the necessity for storage rings as accessories added to the accelerator, but the energy of injection is limited to the "usual" interval of 5 to 10 Mev. In view of the practical realization of this method the authors have considered the possibility of the utilization of the microtron as a universal injector for the synchrotron-accumulator. The problem of the injection of electrons from the microtron into the synchrotron has been discussed in detail in another work (Belovintsev, K. A.; Belyak, A. Ya.; Gromov, A. M.; Moroz, Ye. M.; Cherenkov, P. A. *Atomnaya energiya* 14, 359 (1963)). In the present work the authors limit themselves only to procedures for obtaining, accelerating, and exiting the positrons from the microtron (also discussed by Belovintsev, K. A.; Denisov, F. P. *Atomnaya energiya*, in print). It is concluded that the proposed alternative of the universal injector is clearly shown to be advantageous over two separate injector-accelerators from the viewpoints of techniques, exploitation, and economy (Melekhin,

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ACCESSION NR: AT5007978

2

V. P. Dissertation, Institute of Physical Problems, AN SSSR 1963). For an intensity of around 100 milliamperes per pulse attained by the microtron in question, about 10^7 positrons per pulse are obtained. As for the electron source, cathodes of lanthanum boride (LaB_6) are used for injection, emitting surface 1.5 × 1.5 mm (microtron at Institute of Physical Problems) and 1.5 × 9 mm (Physics Institute im. P. N. Lebedev). As for the optical characteristics of the external beam, the total angular divergence of the beam at output of the microtron at the Lebedev Physics Institute amounts to 1.5×10^{-3} along vertical and 1.5×10^{-2} along the horizontal; the beam height is 1-2 mm depending upon the phase of the oscillations and the radial dimensional is of the order of 3-4 mm depending upon the phase of the radial oscillations. Orig. art. has: 4 figures.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: NP,

NO REF SOV: 004 OTHER: 000

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Card 3/3

L 4235-66 EWT(m)/EPA(w)-2/EWA(m)-2 IJP(c) GS

ACCESSION NR: AT5007977 S/0000/64/000/000/1056/1060

AUTHOR: Belovintsev, K. A.; Belyak, A. Ya.; Vorontsov, S. B.; Cherenkov, P. A.

TITLE: Strong-current microtron-injector

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 1056-1060

TOPIC TAGS: low energy accelerator, magnetron, electron beam

ABSTRACT: By analyzing the characteristics of various low-energy accelerators (Van-de-Graaf generator, cascade generator, pulse transformer, microtron, linear accelerator, etc.) from the viewpoint of their utilization as an injector for the synchrotron, the authors found the application of the microtron for this purpose very promising. The determining motives of their selection were the simplicity of design and construction, high monoenergetic character, good geometric beam parameters, ease of output of a large part of the accelerated electrons, and compactness of this accelerator. In order to experimentally verify the theoretical assumptions, and also to study new possibilities, mainly concerned with the enhancement of the intensity, a 7-Mev microtron was erected and put into operation (October 1961) in the Photomeson Processes Laboratory, Physics Institute im. P. N.

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ACCESSION NR: AT5007977

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Lebedev, Academy of Sciences SSSR. The present report discusses the principal characteristics of the microtron. This accelerator was described in detail in another work (Belovintsev, K. A., Belyak, A. Ya., Gromov, A. M., Moroz, Ye. M., Cherenkov, P. A. *Atomnaya energiya* 14, 359 (1963)). The magnet of the microtron (total weight of the iron and windings--4 tons) ensures the creation of homogeneous (not worse than 0.3%) field in the circular region 50 cm in diameter for a gap of 12 cm between the pole terminals 60 cm in diameter. The maximum value of the homogeneous field in the gap is 4000 oersteds. The magnet's power supply is stabilized with an accuracy of 0.05%, and the power consumed in the operational state (around 1000 oersteds) amounts to 450 watts. The magnet poles are the covering of the vacuum chamber, realized in the form of a brass ring with nine soldered outlet pipes. The vacuum exhaust system consists of a mechanical fore-vacuum and para-oil pumps. A vacuum of 10^{-6} mm of mercury in the chamber's working volume is reached in 1.3 hours after it is attached. The microtron high-frequency system includes the following elements: (a) magnetron generator of 10 cm range operating in the pulse state at a frequency of repetition 50 or 100 hertz and pulse duration of 3 microseconds; (b) waveguide track with cross-section 72 × 44 mm operating in the fundamental wave mode H_{01}; (c) plane cylindrical resonator in which oscillations of

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ACCESSION NR: AT5007977

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the type E_{010} are excited (Kapitsa, S. P.; Bykov, V. P.; Melekhin, V. N. *ZhETF* 41, 368 1961)). Works on the study and improvement of the characteristics of the microtron as a strong-current injector are continuing. Especially interesting is the study of the possibility of the microtron as an injector of positrons for various storage devices (Belovintsev, K. A.; Denisov, F. P. *Atomnaya energiya* (in print)). "In conclusion the authors thank their associates at the Photomeson Laboratory, A. M. Gromov, A. V. Borisov, and V. S. Malofeyev, for their participation in the individual experiments and developments." Orig. art. has: 5 figures.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: NP

NO REF SOV: 004 OTHER: 000

Card 3/3

DENISOV, F.P.; DMITRIYEV, A.; KOSAREVA, K.V.; CHERENKOV, P.A.

Angular and energy distributions of P^{28} recoil nuclei in the $Si^{29}(\gamma,n)P^{28}$ reaction. Zhur. eksp. i teor. fiz. 3 no.1:82-83 Jl '56. (MIRA 15:8)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR.

GERCHIKOV, S.S., professor; LEVITSKIY, Yu.I., redaktor; CHERENKOV, N.V., redaktor; SHPAK, Ye.G., tekhnicheskiy redaktor

[Organizing production in the coal mining industry] Organizatsiia proizvodstva v kamennougol'noi promyshlennosti. Izd. 2-e, ispr. i dop. Moskva, Ugletekhizdat, 1953. 606 p. (MLRA 8:4)
(Coal mines and mining)

ULITSKIY, L.I.; LEVITSKIY, Ya.B., otvetstvennyy redaktor; CHERNIKOV, N.V., redaktor; NADEINSKAYA, A.A., tekhnicheskiy redaktor; KOROVINKOVA, Z.A., tekhnicheskiy redaktor

[The economic aspects of coal preparation] Voprosy ekonomiki obogashcheniia uglei; iz tsikla lektsii dlia gornykh inzhenerov. Moskva, Ugletekhizdat, 1954. 47 p. (MLRA 8:7)
(Coal preparation)

ZVORYKIN, A.A.; KIRZHNER, D.M.; KUNDIN, M.B.; DOROKHIN, N.G., otvetstvennyy redaktor; FEYTEL'MAN, N.G., redaktor; CHERENKOV, N.V., redaktor; ANIKEYEV, G.G., tekhnicheskiy redaktor

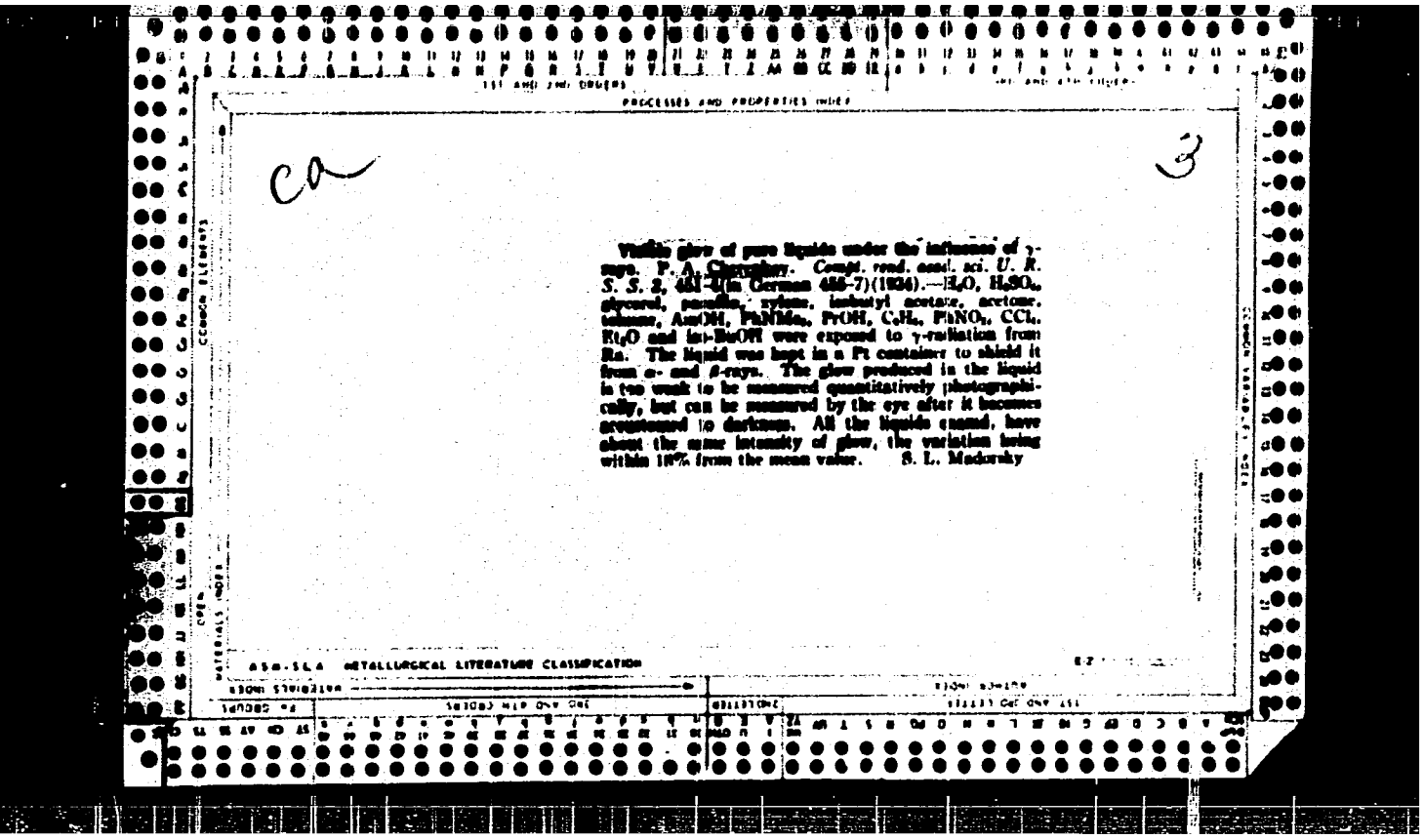
[Economics of the coal industry of the U.S.S.R.] Ekonomika ugol'noi promyshlennosti SSSR. Izd. 2-e, perer. i dop. Moskva, Ugletekhizdat, 1954. 427 p. [Microfilm] (MLRA 8:2)
(Coal mines and mining)

TARANYKO, Petr Mikhaylovich; CHERNKOV, M.V., redaktor; FEYTEL'MAN, N.G., redaktor; ALADOVA, Ye.I., tekhnicheskiy redaktor; KOROVENKOVA, Z.A., tekhnicheskiy redaktor

[Economics, organization, and planning of the coal industry; collection of examples and problems] Ekonomika, organizatsiia i planirovanie ugol'noi promyshlennosti; sbornik primerov i zadach. Moskva, Ugletekhizdat, 1955. 127 p. (MLRA 8:11)
(Coal mines and mining)

YEROKHIN, M.M.; SIDERMAN, I.G.; CHERENKOV, N.V.

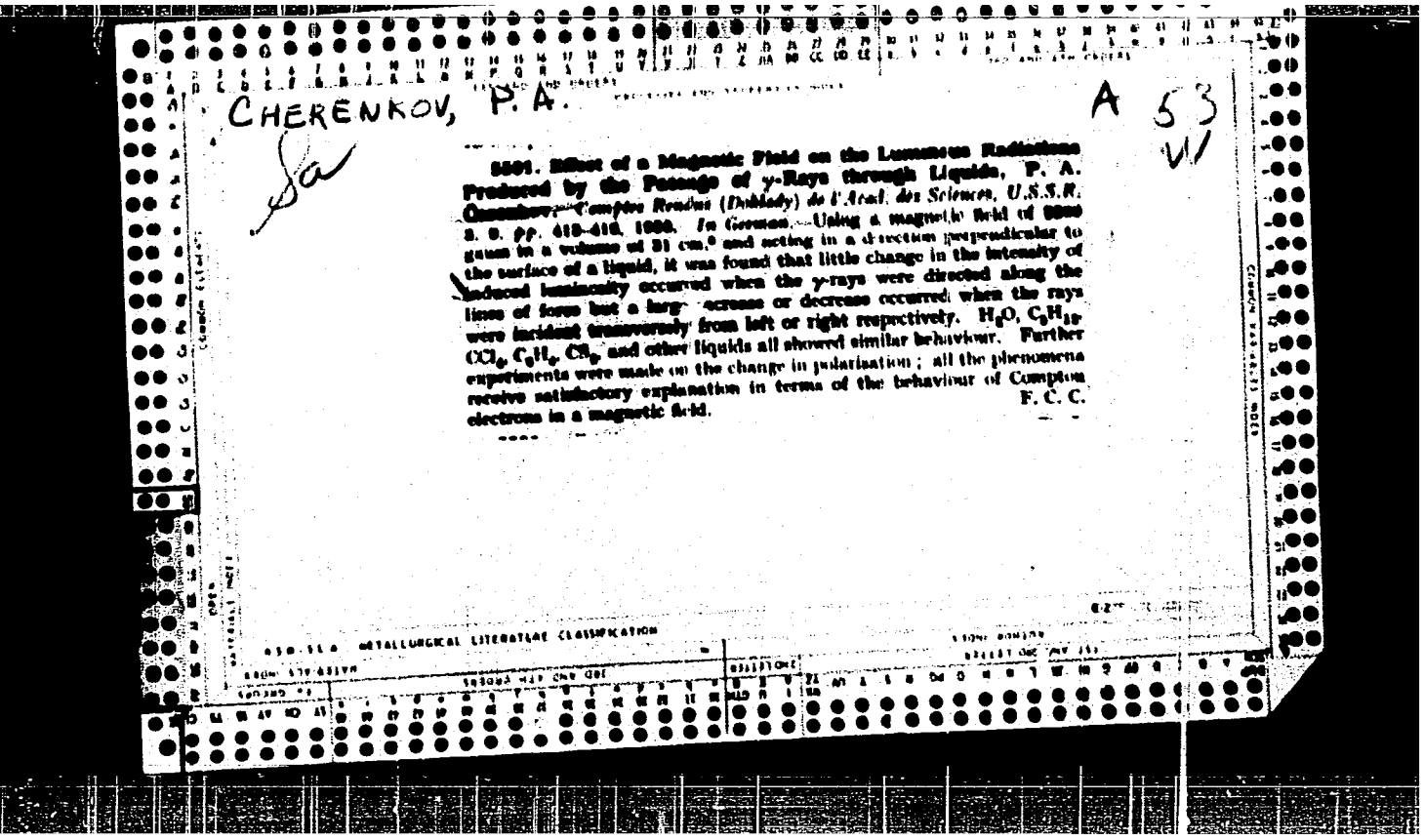
Cutting the costs of coal in the "Leninugol'" Trust of "Kuzbassugol'" Combine. Ugol' 34 no.6:20-22 Je '59. (MIRA 12:8)
(Kuznetsk Basin--Coal mines and mining--Costs)



CA

3

Visible glow of pure liquids under the influence of γ-rays. P. A. Cherenkov. *Compt. rend. acad. sci. U. R. S. S.* 2, 451-3 (in German 466-7)(1934).—H_2O, H_2SO_4, glycerol, paraffin, xylene, isobutyl acetate, acetone, toluene, AmOH, $PhNMe_2$, PrOH, C_6H_6, $PhNO_2$, CCl_4, Et_2O and iso-BuOH were exposed to γ-radiation from Ra. The liquid was kept in a Pt container to shield it from α- and β-rays. The glow produced in the liquid is too weak to be measured quantitatively photographically, but can be measured by the eye after it becomes accustomed to darkness. All the liquids named, have about the same intensity of glow, the variation being within 10% from the mean value. S. L. Madorsky

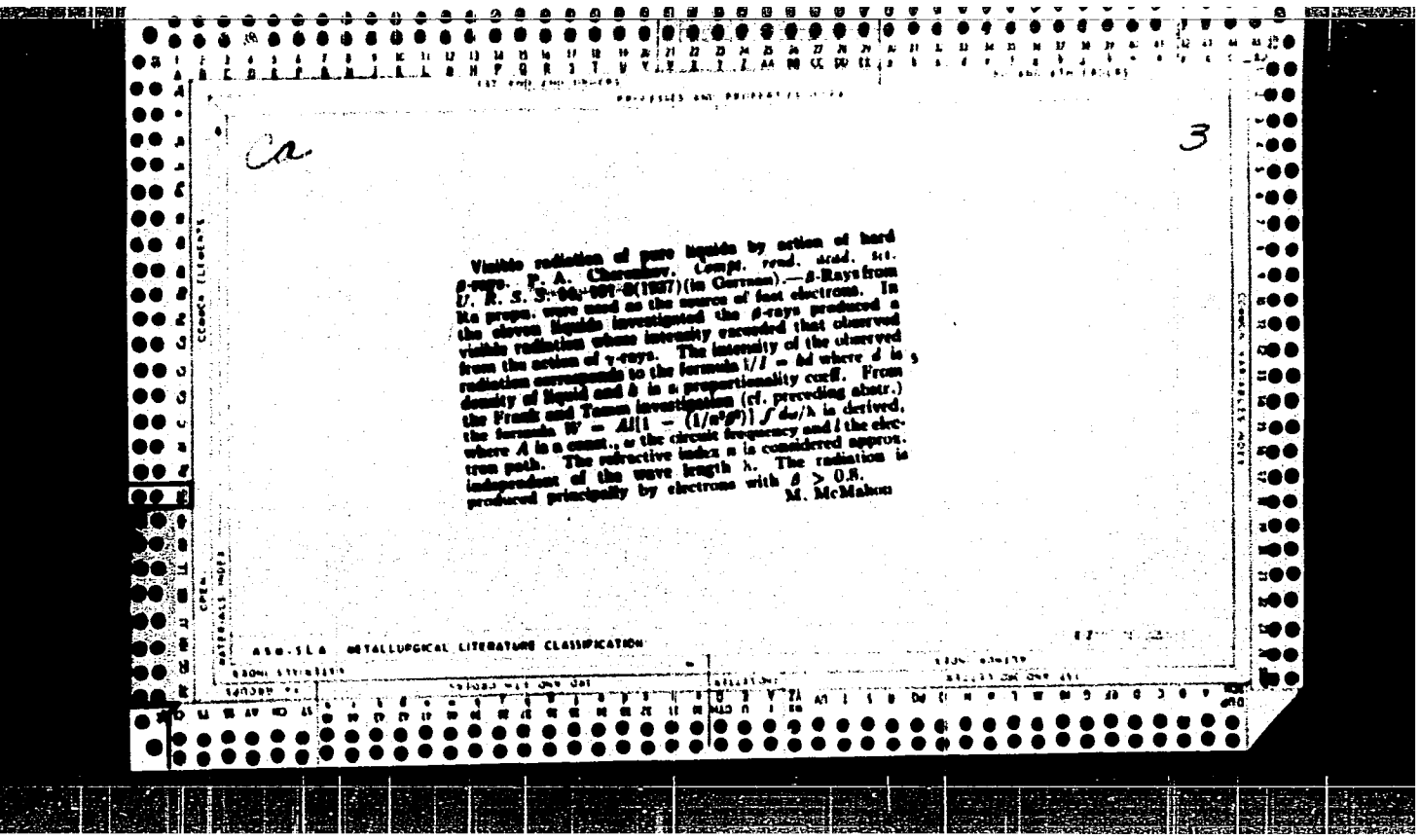


CHERENKOV, P. A.

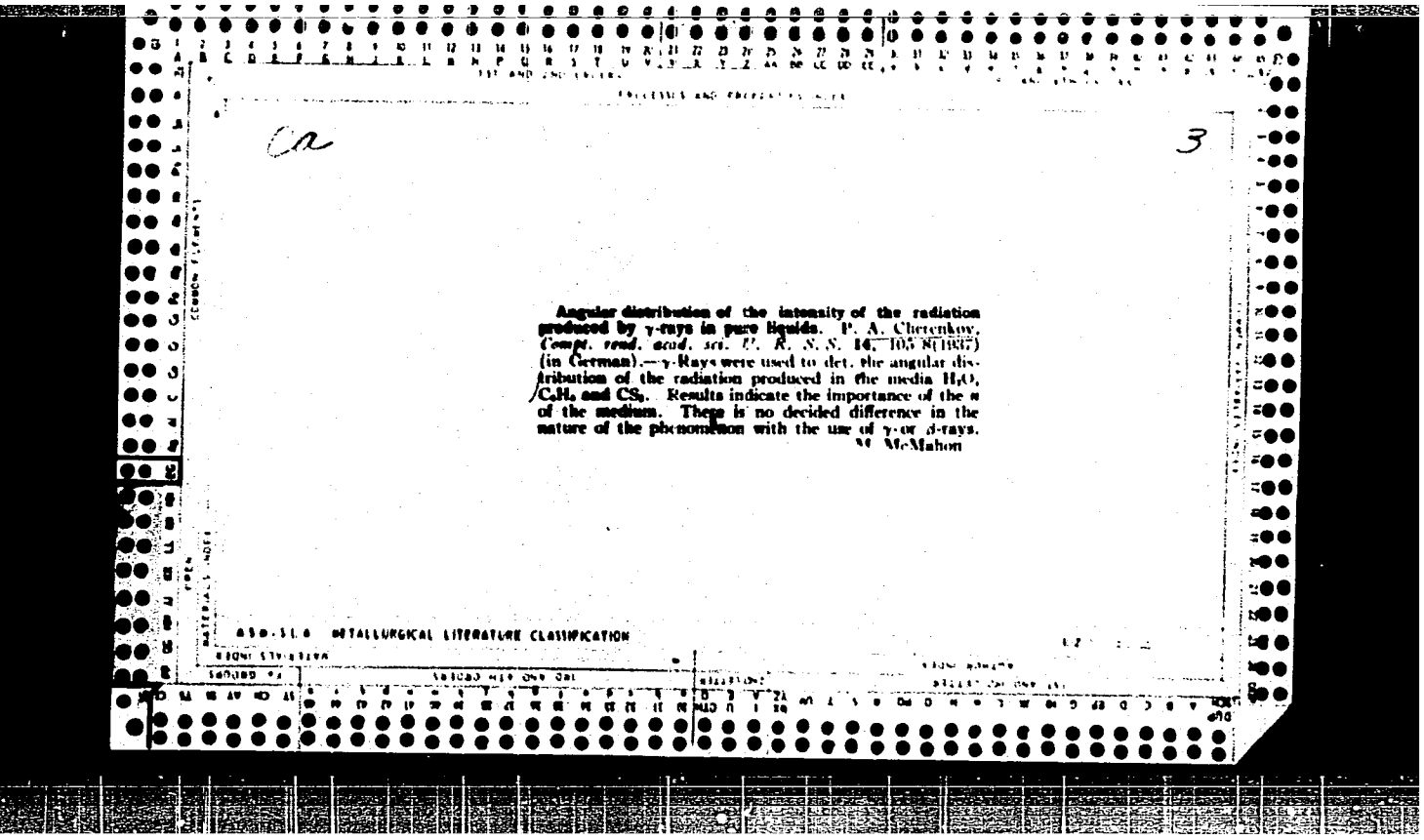
A 53
VI

5501. Effect of a Magnetic Field on the Luminous Radiations Produced by the Passage of γ-Rays through Liquids. P. A. Cherenkov. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 3, 9, pp. 413-416, 1936. *In German.*—Using a magnetic field of 8000 gauss in a volume of 31 cm.³ and acting in a direction perpendicular to the surface of a liquid, it was found that little change in the intensity of induced luminosity occurred when the γ-rays were directed along the lines of force but a large increase or decrease occurred when the rays were incident transversely from left or right respectively. H_2O, C_6H_{12}, CCl_4, C_6H_6, CH_3, and other liquids all showed similar behaviour. Further experiments were made on the change in polarisation; all the phenomena receive satisfactory explanation in terms of the behaviour of Compton electrons in a magnetic field.

F. C. C.



Visible radiation of pure liquids by action of hard β-rays. P. A. Cherenkov. Compt. rend. acad. sci. U. R. S. S. 2(10):451-457(1937)(in German).—β-Rays from Ra preps. were used as the source of fast electrons. In the eleven liquids investigated the β-rays produced a visible radiation whose intensity exceeded that observed from the action of γ-rays. The intensity of the observed radiation corresponds to the formula $I/I = Ad$ where d is density of liquid and A is a proportionality coeff. From the Frank and Tamm investigation (cf. preceding abstr.) the formula $W = Al[1 - (1/n^2\beta^2)] \int d\omega/\lambda$ is derived, where A is a const., ω the circular frequency and l the electron path. The refractive index n is considered approx. independent of the wave length λ. The radiation is produced principally by electrons with $\beta > 0.8$.
M. McMahon

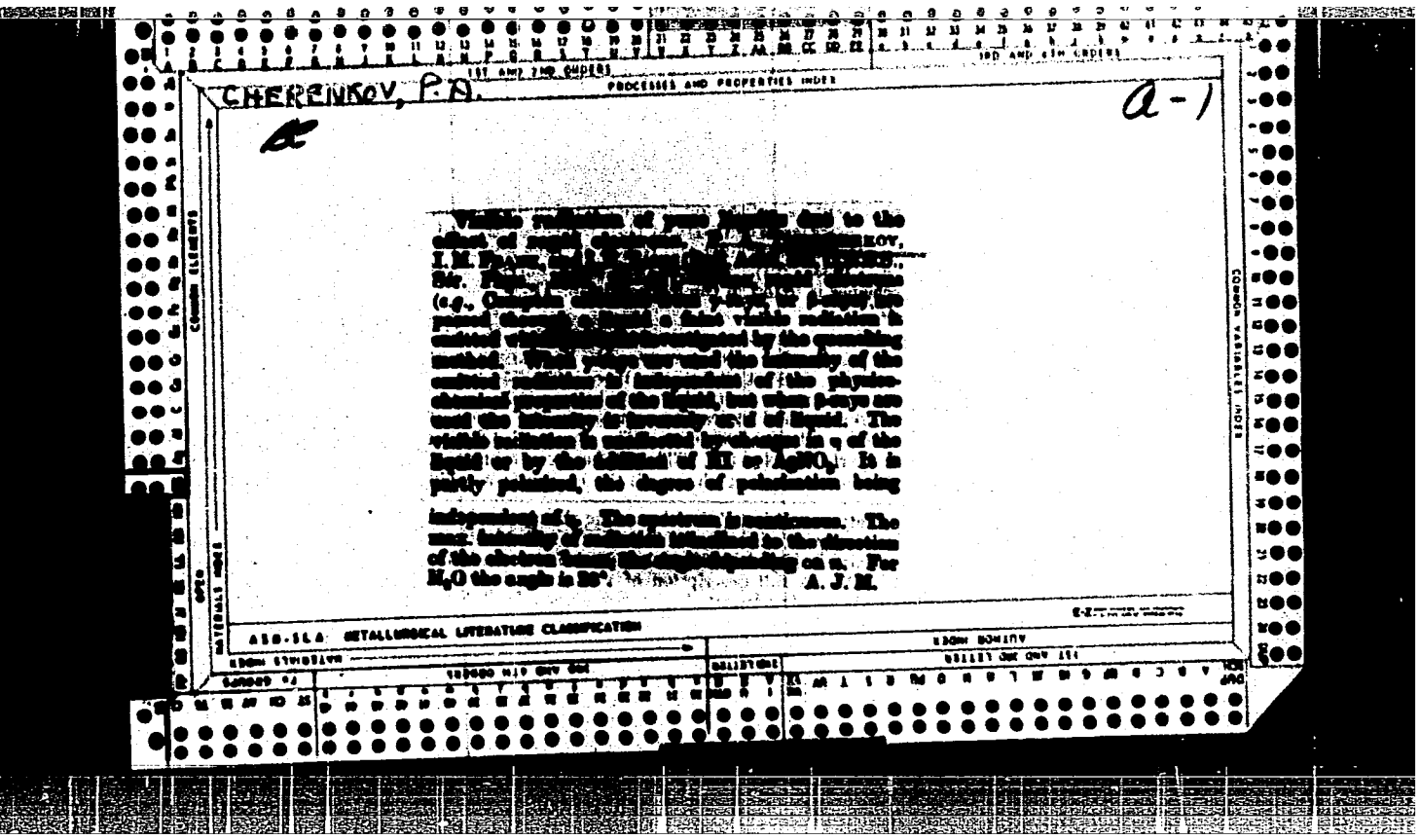


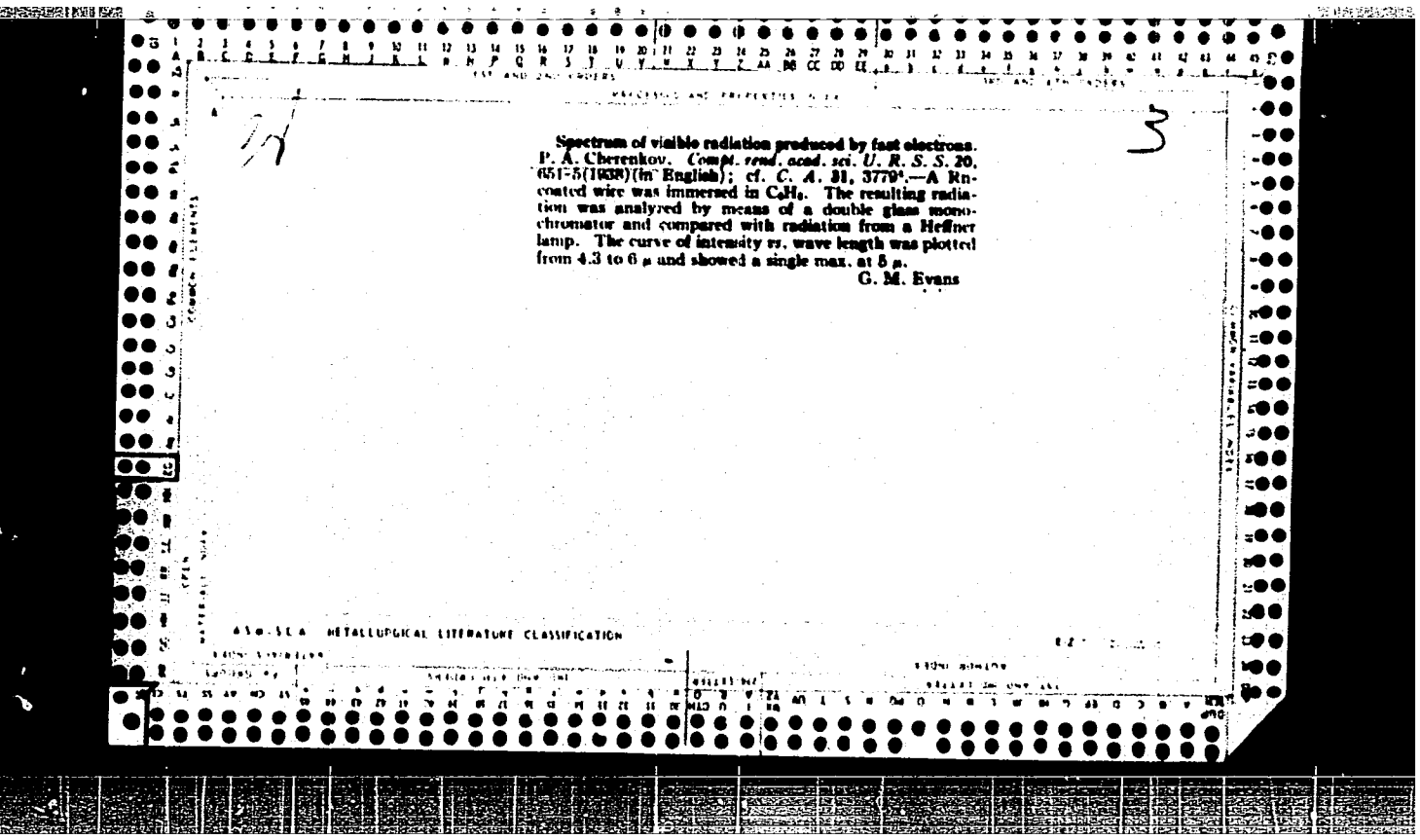
Ca

3

Angular distribution of the intensity of the radiation produced by γ-rays in pure liquids. P. A. Cherenkov. *Compt. rend. acad. sci. U. R. S. S.* **14**, 105-8 (1937) (in German).—γ-Rays were used to det. the angular distribution of the radiation produced in the media H_2O, C_6H_6 and CS_2. Results indicate the importance of the n of the medium. There is no decided difference in the nature of the phenomenon with the use of γ- or β-rays.
M. McMahon

ASD-STI-0 METALLURGICAL LITERATURE CLASSIFICATION

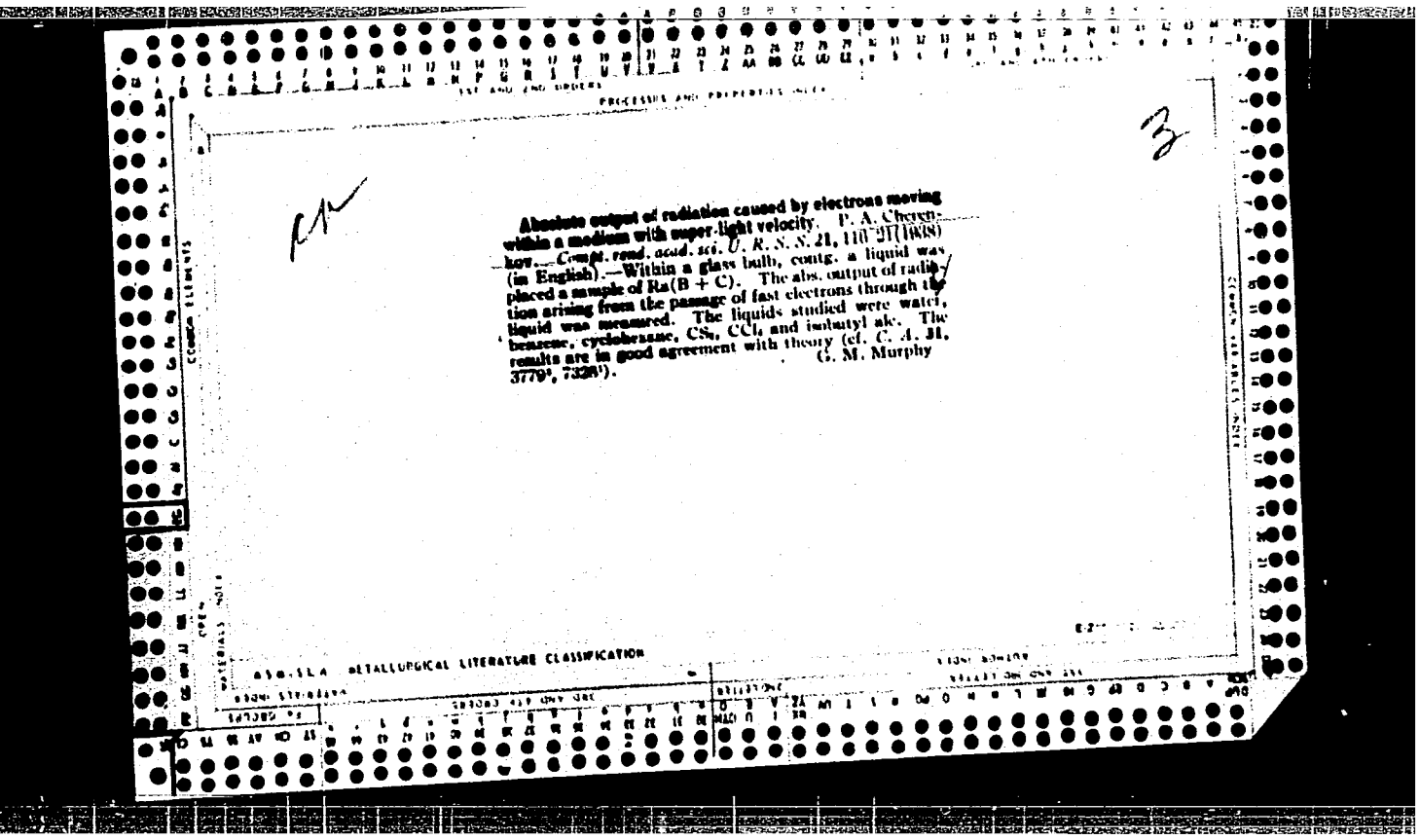




Spectrum of visible radiation produced by fast electrons. P. A. Cherenkov. *Compt. rend. acad. sci. U. R. S. S.* 20, 651-5(1938)(in English); cf. *C. A.* 31, 3779⁸.—A Rn-coated wire was immersed in C_6H_6. The resulting radiation was analyzed by means of a double glass monochromator and compared with radiation from a Hefner lamp. The curve of intensity vs. wave length was plotted from 4.3 to 6 μ and showed a single max. at 5 μ.

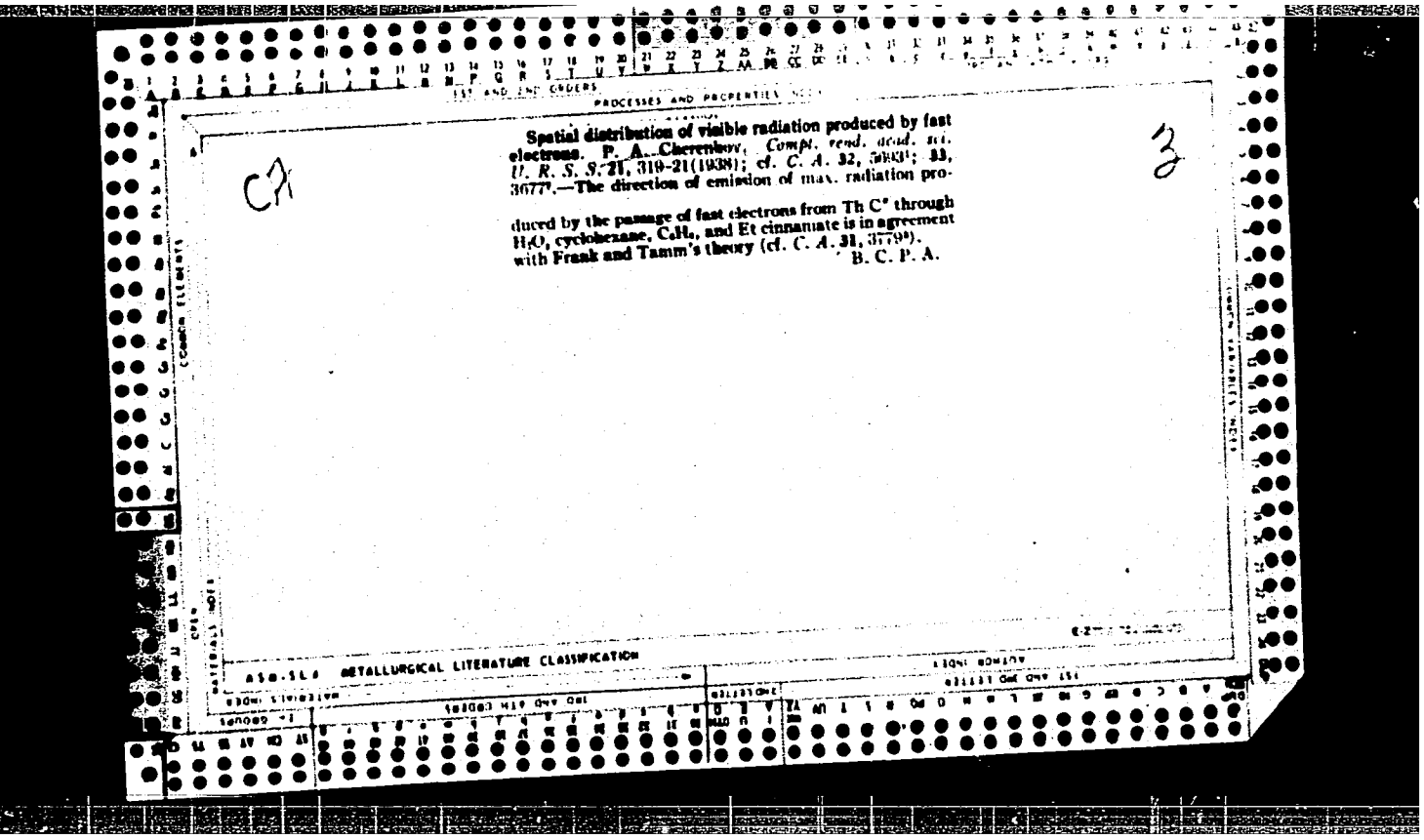
G. M. Evans

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION



Absolute output of radiation caused by electrons moving within a medium with super-light velocity. P. A. Cherenkov. *Compt. rend. acad. sci. U. R. S. S.* 21, 110–11 (1938) (in English).—Within a glass bulb, contg. a liquid was placed a sample of Ra(B + C). The abs. output of radiation arising from the passage of fast electrons through the liquid was measured. The liquids studied were water, benzene, cyclohexane, CS_2, CCl_4 and isobutyl alc. The results are in good agreement with theory (cf. C. A. 31, 3779[9], 7328[1]). G. M. Murphy

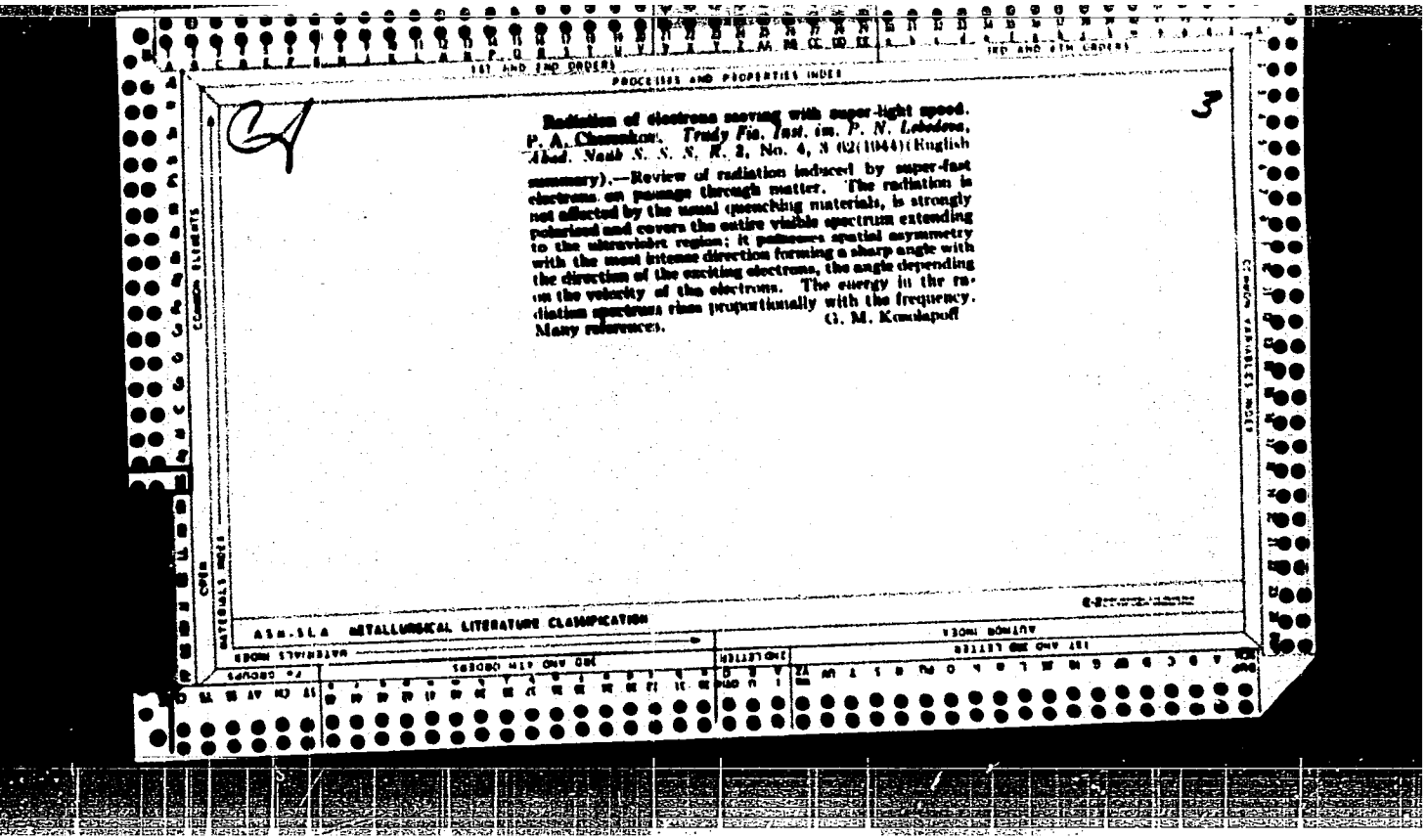
METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES

Spatial distribution of visible radiation produced by fast electrons. P. A. Cherenkov. *Compt. rend. acad. sci. U. R. S. S.* **21**, 319-21(1938); cf. *C. A.* **32**, 5880; **33**, 36777.—The direction of emission of max. radiation produced by the passage of fast electrons from Th C″ through H_2O, cyclohexane, C_6H_{12}, and Et cinnamate is in agreement with Frank and Tamm's theory (cf. *C. A.* **31**, 3179⁹). B. C. P. A.

METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

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3

Radiation of electrons moving with super-light speed. P. A. Cherenkov. *Trudy Fiz. Inst. im. P. N. Lebedeva, Akad. Nauk S. S. S. R.* 2, No. 4, 3-62(1944)(English summary).—Review of radiation induced by super-fast electrons on passage through matter. The radiation is not affected by the usual quenching materials, is strongly polarized and covers the entire visible spectrum extending to the ultraviolet region; it possesses spatial asymmetry with the most intense direction forming a sharp angle with the direction of the exciting electrons, the angle depending on the velocity of the electrons. The energy in the radiation spectrum rises proportionally with the frequency. Many references. G. M. Kondratieff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CHERENKOV, P. A.

PA 173T91

USSR/Nuclear Physics - Cosmic Rays 21 Dec 49

"Experiments With the Wilson Cloud Chamber at 3,860 Meters," R. V. Sadovskiy, P. A. Cherenkov, I. V. Chuvilo, L. S. Eyg, Phys Inst imeni Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXIX, No 6, pp. 789-792

Conclusions: Multicharged particles observed by authors in subject expt must be products of nuclear fissions occurring in middle layers of the atmosphere. Submitted 3 Nov 49 by D. V. Skobel'tsyn.

173T91

CHERENKOV, Pavel A.

"Cherenkov Radiation by 340 MeV-Protons," Physikalische Blätter, Heft 12/1951, page 566.

TRANSLATION AVAILABLE -ATI-49-52, 12 Jan 52

WILSON, John Graham, 1911; KOKURIN, Yu.L.[translator]; BARADZEY, L.T. [translator]; LARSKIY, L.G., khudozhnik; CHERNIKOV, P.A., redaktor; GERASIMOVA, E.S., tekhnicheskiy redaktor.

['The principles of cloud-chamber tekhnique; translated from the English] Kamera Vil'sona. Perevod s angliiskogo IU.L.Kokurina i L.T. Baradzei. Moskva, Izd-vo inostrannoi lit-ry, 1954. 151 p. (Cloud chamber) (MLRA 7:8)

Cherenkov, P. A.

Energy distribution of the fragments from the fission of uranium and thorium by γ-rays. L. A. Kondurova, P. A. Cherenkov, and L. V. Chuvilo. Soviet Phys. "Doklady" 1, 104-6(1956)(English translation).—See C.A. 51, 884f. B. M. R.

3

CHERENKOV, P.A.

Category : USSR/Nuclear Physics - Elementary Particles C-3

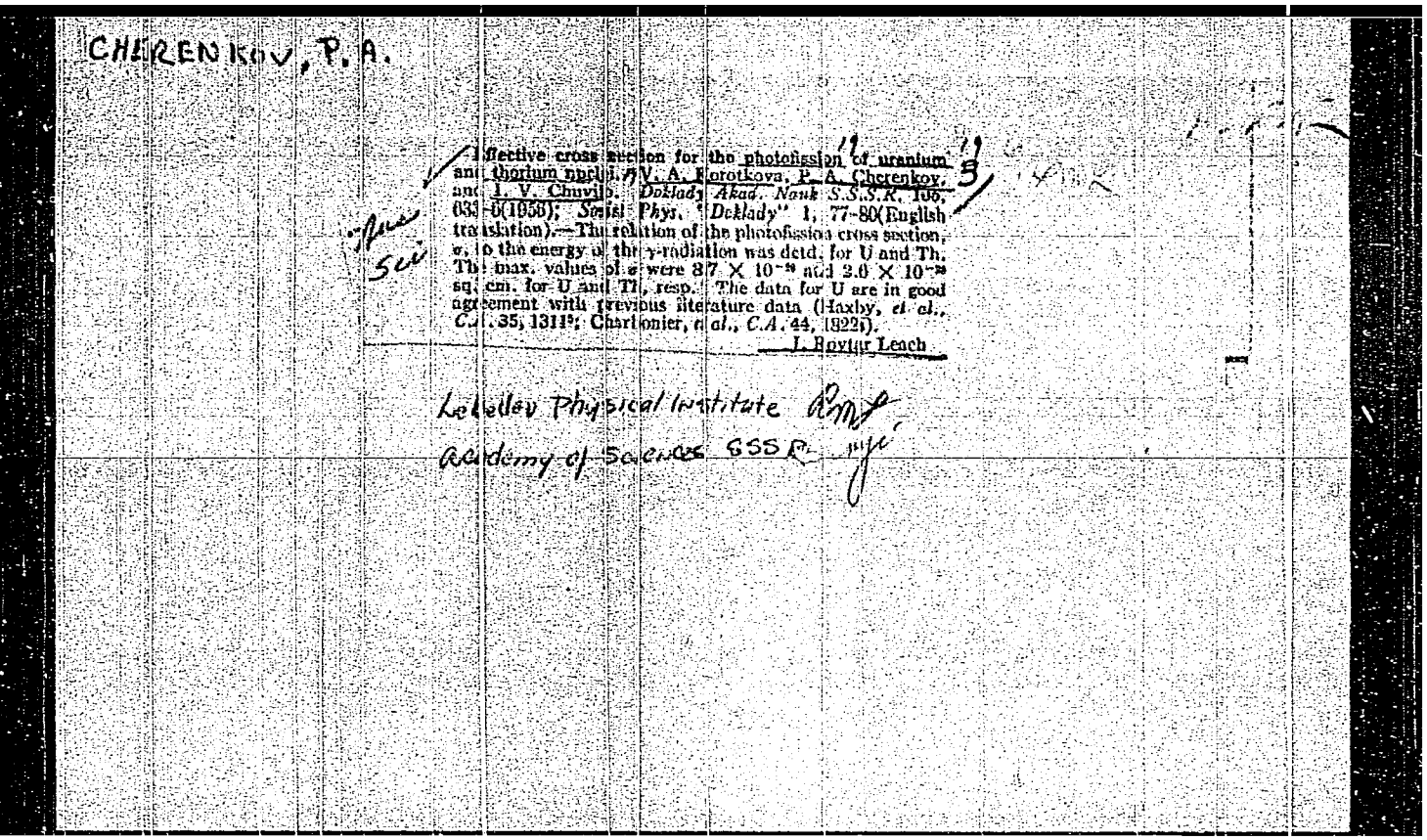
Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 367

Author : Kurnosova, L.V., Razorenov, L.A., Cherenkov, P.A.
Inst : Phys. Inst. USSR Acad. of Sciences
Title : Scattering of 250 Mev Photons by Free Electrons

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 4, 690-694

Abstract : An investigation was made of the Compton scattering of 222 -- 233 and 235 -- 248 Mev photons for cases, when almost the entire photon energy is transferred to the recoil electrons. The electrons and positrons formed by the photons were deflected by a magnetic field and recorded by telescopes made of counters, connected for double coincidence. The values of the Compton-scattering cross sections were determined from the ratio to the value of the cross section of the formed pairs. The relationships obtained are in agreement, within the limits of precision of the measurements, with those calculated from the Bethe-Heitler equation for the pair-formation cross section and from the Klein-Nishina-Tamm equation for the Comptron-scattering cross section.

Card : 1/1



CHERENKOV, P. A.

Effective cross section for the photofission of uranium and thorium nuclei. V. A. Korotkova, P. A. Cherenkov, and I. V. Chuvilo. *Doklady Akad. Nauk S.S.S.R.* 106, 633–6(1956); *Soviet Phys. "Doklady"* 1, 77–80(English translation).—The relation of the photofission cross section, σ_f, to the energy of the γ-radiation was detd. for U and Th. The max. values of σ_f were 8.7×10^{-28} and 2.0×10^{-28} sq. cm. for U and Th, resp. The data for U are in good agreement with previous literature data (Haxby, *et al.*, *C.A.* 35, 1311⁹; Charbonnier, *et al.*, *C.A.* 44, 1822i).

J. Boyle Leach

Lebedev Physical Institute
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CHERNYKH, P.A.

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ENERGY DISTRIBUTION OF URANIUM AND THORIUM γ-RAY PHOTOFISSION FRAGMENTS. V. A. Karotkova, P. A. Chernykov, and I. V. Chuvilo (Lebedev Inst. of Physics, Academy Acad. Nauk S.S.S.R.) 105, 611-13(1956) Feb. 11 (In Russian)

Energy spectra of natural mixtures of U isotopes and Th ionic fission fragments excited by γ-radiation bremsstrahlung at maximum energies of 7.7 Mev were investigated on the Lebedev Inst. of Physics synchrotron. A differential momentum ionization chamber filled with A was used for determining the energies and observing the processes of fission. The electronic component of ionization moments produced by photofission fragments in the working area of the chamber was used for the recording. The moments were intensified by a proportional intensifier and was recorded on the film by an oscillograph. The radiotechnical part of installation was similar to the facilities which had been used in previous studies for measuring effective photofission cross sections. The provisional selective scheme recorded only the energies which occurred at the moment of γ beam passage through the ionization camera. A wire-gauze electrode was installed in front of the collecting electrode of the chamber. The calculation effectiveness of screening by the wire-gauze electrode was about 96%. The results of experiments with U and Th photofission are quantitatively analogous to the data obtained in studies of neutron fission. (R.V.J.)

CHERENKOV, P.A.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1473
AUTHOR ADO, Ju.M., ČERENKOV, P.A.
TITLE The Energy Distribution in the Spectrum of the Incoherent Radiation of Electrons Moving in a Synchrotron.
PERIODICAL Dokl.Akad.Nauk, 110, fasc.1, 35-37 (1956)
Issued: 11 / 1956 reviewed: 11 / 1956

Here the energy distribution of the radiation of monoenergetic electrons with the energies of 150; 225; 250 MeV in the spectral domain of from 4000 to 6100 Å is measured. The electrons were accelerated by means of the 250 MeV synchrotron of the Physical Institute of the Academy of Science in the USSR. The spectral analysis of the radiation was carried out by means of a prism monochromator before the input gap of which a photomultiplier was fitted. The signal emitted from the output of the photomultiplier was led to a parallel current amplifier with negative feedback coupling and from there to a loop oscillograph where it was registered by a 5000 c vibrator on a photofilm. Together with the light impulse also the signals of an impulse-ionization chamber, which are proportional to the intensity of the bremsstrahlung and therefore also to the number of accelerated electrons, were registered by means of the loop oscillograph. In this way it was possible to normalize the oscillograms to the same number of electrons. Besides, the impulses of the deflecting high-frequency accelerating voltage were registered. For each wavelength 8 to 10 cycles were recorded.. The monochromator - photomultiplier system was gauged by means of a standard temperature lamp; it makes the recording of spectra within the interval of from 400 to 6100 Å possible. Treat-

ment of the oscillograms consisted in measuring the strength of the light impulses at the moment in which the accelerating voltage was switched on, as well as reducing results to one intensity.
The theoretically computed curves of the energy distribution in the spectrum of the radiation of electrons with 150; 225 and 250 MeV are compared in a diagram with the corresponding experimental values. The intensity distributions obtained at certain electron energies confirm theoretical conclusions within the limits of measuring errors. The observed systematic deviation of experimental points within the range of short waves (even though it does not exceed the limit of measuring errors) is apparently due to the lower degree of accuracy of the gauging of the spectral sensitivity of the apparatus within this range.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the USSR.

CHERENKOV P.A.

120-2-8/37

AUTHOR: Gorbunov, A. N., Spiridonov, V. M., and Cherenkov, P. A.

TITLE: An Application of the Wilson Cloud Chamber to Photonuclear Studies. (Primeneniye Kamery Vil'sona dlya Issledovaniya Fotoyadernykh Protsessov.)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.2, pp. 29 - 32 (USSR).

ABSTRACT: The use of the Wilson cloud chamber in investigations of the interaction between high energy gamma quanta, though cumbersome, has the advantage that it makes possible an analysis of practically all the nuclear processes initiated by the radiation in the gas. In the present article the authors describe a few interesting problems occurring where the Wilson chamber is used in the investigation of photonuclear processes induced by high energy gamma-radiation (maximum energy 260 MeV) from the synchrotron of the Institute of Physics of the Academy of Sciences of the USSR. The synchrotron generates impulses of gamma rays at the repetition frequency of 50 secs^{-1}. In order to obtain the best possible working conditions for the chamber a special working regime had to be established for the synchrotron and the working of the chamber synchronised with the emission of the radiation pulse. The procedure

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adopted was that given in reference 3. The procedure involves an application of the chamber to gamma ray studies with practically no loss in the efficiency of the accelerator. The intensity of the radiated beam of the above synchrotron is 2 x 10" MeV/cm^2 at 260MeV, and at 10m from the target. The energy flux per pulse is approximately 7×10^7 MeV/cm^2. Special measures based on the results of reference 3 which are necessary to eliminate the electron and positron background had to be applied. These measures were :- 1) the beam was injected into the chamber through a side window covered by an organic film 70μ thick; 2) the beam was collimated by a lead collimator 15cm long placed at 3.5m from the chamber; 3) a magnet placed behind the collimator removed positrons and electrons from the γ-ray beam; 4) an evacuated tube was placed between the collimator and the chamber so as to eliminate electrons and positrons formed in air. As a result of the above precautions the number of unwanted electrons and positrons associated with the gamma beam was reduced by a factor of 1000. The following working procedure was adopted. The main expansion was followed by a fast (0.5 sec) compression

 and then by a slow expansion followed once more by a fast

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compression. As a result of these procedures the chamber was effectively cleared of droplets after each expansion, the electron background was reduced and γ-ray beams of up to 10^8 MeV per pulse could be employed with the camera set for the detection of relativistic particles. In the case of strongly ionising particles the working γ-ray intensity can be increased still further (by a factor of 5 - 10) if one works with a lower chamber sensitivity. A graph of the synchrotron output as a function of time (under working conditions), and 3 cloud chamber photographs are given. There are 6 references, 5 of which are Slavic.

SUBMITTED: December, 10, 1956.

ASSOCIATION: Institute of Physics imeni P. N. Lebedev of the Academy of Sciences of the USSR. (Fizicheskiy Institut im. P. N. Lebedeva AN SSSR.)

AVAILABLE: Library of Congress.

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CHERENKOV, P.A.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1959
AUTHOR CERENKOV,P.A.
TITLE The Soviet Exhibition on the Peaceful Uses of Atomic Energy held at Peking.
PERIODICAL Atomnaja Energija, 2, fasc.1, 72-72 (1957)
Issued: 3 / 1957

On August 15th 1956, after a two months' running, the Soviet Scientific and Technical Exhibition on the Peaceful Uses of Atomic Energy was closed. Many of the more than 200.000 visitors had come also from other parts of China. Among them were workmen and employees of various enterprises and factories, university students, scientists, technicians, students of medicine, farmers, soldiers, etc. Also the chiefs of the Chinese Communist Party and members of the Chinese government visited the exhibition.
The following exhibits were shown: diagrams, graphs, photos, models of all sorts of devices, as well as other material. Also material referring to the efficient atomic power plants projected in the Soviet Union and concerning the use of atomic energy for purposes of transport was shown. The methods employed in the application of marked atoms and of radioactive rays in technology, agriculture, and medicine were demonstrated.
Throughout the exhibition also films were shown which dealt with problems connected with the peaceful uses of atomic energy. The collaborators of this exhibition delivered dozens of lectures before a large auditorium. More than 50 scientific and popular scientific articles were written by Soviet and

Atomnaja Energija, 2, fasc.1,72-72 (1957) CARD 2 / 2 PA - 1959

Chinese specialists for the Chinese press. In compliance with the wish expressed by some Chinese organizations a large group of Chinese specialists of various fields of science were offered opportunities of becoming closely acquainted with the material of the exhibition. More than 8000 specialists availed themselves of this opportunity.
The exhibition owes much of its success to the constant care and attention displayed by the Chinese government. The author describes the organization and carrying out of this exhibition as one of the numerous manifestations of the close friendship between the USSR and China.

INSTITUTION:

OS'MAKOV, I.G., kand. sel'skokhoz. nauk; POLEZHAYEV, I.A., kand. sel'skokhoz. nauk; CHERENKOV, A.D., kand. sel'skokhoz. nauk

Growing sugar beets in the non-Chernozem zone. Zhivotnovodstvo 23 no.3:45-49 Mr '61. (MIRA 17:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut kormov imeni V.R. Vil'yamsa.

CHERENKOV, P.A.

ADO, Yu.M.; CHERENKOV, P.A.

Incoherent electron emission in the synchrotron and some applications of this phenomenon for studying the performance of accelerators. (MIRA 10:10)
Aton.energ.supplement no.4:49-56 '57.
(Synchrotron) (Particle accelerators)

Cherenkov, P.A.

BELYAK, A.Ya.; VEKSLER, V.I.; KAMUSHKOV, V.M.; CHERENKOV, P.A.; YABLOKOV, B.M.

Special features of the 280 Mev synchrotron operated by the Institute of Physics, U.S.S.R. Academy of Sciences. Atom.energ.supplement no.4:57-72 '57. (MIRA 10:10)

(Synchrotron)

DENISOV, F. P., and CHERENKOV, P. A.

"Parcours des Noyaux de Recul de ^{24}Na et Mechanisme des Reactions Photonucleaires $^{27}Al(\gamma, 2pn)$, $^{28}Si(\gamma, 3pn)^{31}P$ $(\gamma, 4p3n)$ et $^{32}S(\gamma, 5p3n)$ dans le domaine d'energie des gamma jusqu'a 260Mev.

Report presented at the Intl. Congress for Nuclear Interactions (Low Energy) and Nuclear Structure, Paris, 7-12 July 1958.

SOV/56-35-2-51/60

21(7)

AUTHORS: Denisov, F. P., Cherenkov, P. A.

TITLE: The Ranges of the Recoil Nuclei Na^{24} and the Mechanism of Some Photonuclear Reactions (Probegi yader otdachi Na^{24} i mekhanizm nekotorykh fotoyadernykh reaktsiy)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2(8), pp 544-546 (USSR)

ABSTRACT: Usually, the so-called "quasideuteron model" is used for the description of the photonuclear reactions at highphoton energies. According to this model, the reaction is represented by 3 successive processes: 1) absorption of the γ-quantum by a nucleon pair of the nucleus, 2) intranuclear nucleon cascade which is generated by these nucleons, 3) evaporation of particles from an excited nucleus which was generated after the cascade. One of the most direct methods of verifying this model is by the measurement of the ranges of the recoil nuclei. The authors measured the effective thickness t of the specimen (which is proportional to the range) for the recoil nuclei Na^{24} which were generated by photonuclear

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The Ranges of the Recoil Nuclei Na^{24} and the Mechanism of Some Photonuclear Reactions

reactions on Al, Si, P, and S. t is defined by $t = N/a_o$; where N denotes the number of the recoil nuclei flying away from 1 cm^2 of the specimen surface (the thickness of which is greater than the maximum range of the recoil nuclei) a_o denotes the total number of the recoil nuclei generated in the unit mass of the specimen. In order to determine N, the specimens were interlaid with triacetate films (thickness 20 μ) which collected the recoil nuclei Na^{24}. The piles consisting of specimens and films were placed in a 260 MeV bremsstrahlung beam of the synchrotron of the FIAN (=Fizicheskiy institut Akademii nauk) (Physics Institute, AS USSR) and were irradiated for 10 - 15 hours. 10 - 15 hours after the end of the irradiation only the characteristic activity of Na^{24} was observed in the films and specimens. The ratio N/a_o was calculated from the measured activities. The results of these calculations are demonstrated in a table and in a diagram, and are also compared with the results of the calculations according to the model of the compound nucleus and according to the "quasideuteron" model. A model that assumes the formation of a compound nucleus with subsequent evaporation of nucleons does not explain the above-

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mentioned reactions. Only further experiments and more precise calculations can solve the problem as to whether the above-mentioned discrepancies can be eliminated by an appropriate modification of the "quasideuteron" model, or it is necessary to introduce an essentially new mechanism of the interaction. There are 2 figures, 1 table, and 4 references, 0 of which is Soviet.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev, AS USSR)

SUBMITTED: May 21, 1958

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SOV/56-37-6-16/55

AUTHORS: Belousov, A. S., Rusakov, S. V, Tamm, E. I., and Cherenkov, P. A.

TITLE: Search for Particles with Masses Between 6 and 25 Electron Masses

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1613-1618 (USSR)

ABSTRACT: Experiments were carried out for the purpose of elucidating the question whether γ-quanta generate particles with mass lying between 6 and 25 electron masses according to the production cross sections as predicted by the electromagnetic theory of pair production. For this investigation fast coincidence circuits were used to measure the time of flight of particles with a given momentum between two scintillation counters. The following diagram illustrates the geometry of the setup:

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Search for Particles with Masses Between 6 and 25 Electron Masses

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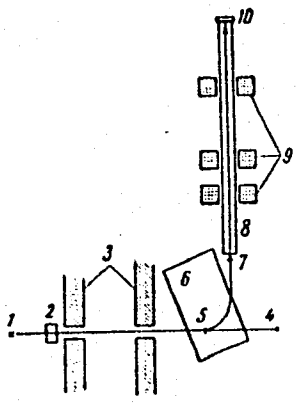

Fig. 1. Geometry of the experiment setup: (1) synchrotron target; (2) monitor chamber; (3) lead collimator; (4) direction of the bremsstrahlung beam; (5) lead target; (6) magnet; (7) scintillation counter; (8) vacuum tube; (9) focusing lenses; (10) scintillation counter.

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The irradiation of the lead target by bremsstrahlung produced particles pairs. The separation of particles with a proper momentum was achieved by means of the magnetic field. The counters in the path of the particles at a distance S made it possible to measure the period separating the particles on their passage through the first and the second counter. The difference in the passage time of the particle with mass M and an electron having identical momentum was obtained from the relation $\tau_o = S(1-\beta_m)/c\beta_M$. Particles with mass M can be identified only when $N_{background}/N_e < N_M/N_e$, where, N_M - counting rate at the maximum in the curve of captured collisions for particles with mass M. Experiments were made with Pb target 0.5 thick for M = 8 and 12 m_e and 0.25 mm for M = 16 and 20 m_e. The theoretical coincidence

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counting rate was compared with the experimental rate obtained for parameters of the experimental setup corresponding to the registration of particles with the expected mass. In each set of experiments the ratio of the electron counting rate to the background was also measured. The results obtained show that the cross sections for the production of particles by γ-quanta with unit charge, spin 1/2 and masses lying between 6 and 25 m_e do not correspond to those predicted by the electromagnetic theory. The work was performed under the guidance of V. I. Veksler; P. N. Shareyko, A. A. Rudenko, A. D. Makov made contributions in the course of this work. There is a schematic diagram of the setup; 2 tables; 2 graphs; and 14 references, 9 Soviet, 3 U.K., 1 French, 1 U.S. The U.S. and U.K. references are: W. Davies, D. Shaw. Proc. Phys. Soc. A64, 1006, 1951; U. Jánossy, C. B. A. Melusner. Nature, 63, 181, 1949; E. W. Cowan. Science, 108, 534, 1948; D. Broadbenf, U. Jánossy.

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Search for Particles with Masses Between 6 and 25 Electron Masses

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SOV/56-37-6-16/55

Proc. Roy. Soc. 192, 364, 1948.

SUBMITTED: July 29, 1959

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21 (7), 24 (5)
AUTHOR: Cherenkov, P. A.

SOV/53-68-3-2/11

TITLE: Radiation of Particles With a Velocity Greater Than That of Light and Some Applications of This Radiation in Experimental Physics (Izlucheniye chastits sverkhsvetovoy skorosti i nekotoryye primeneniya etogo izlucheniya v eksperimental'noy fizike)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 68, Nr 3, pp 377-386 (USSR)

ABSTRACT: This is the reproduction of a lecture delivered by the author on the occasion of his being awarded the Nobel Prize at Stockholm on December 11, 1958. - Already in 1934 the author and S. I. Vavilov had published two reports (Refs 1, 2), in which it was shown that the γ-rays of radium, besides luminescence of the solutions, also cause a weak visible glow of the solvent. Further investigations showed that this is not caused immediately by the γ-rays, but by fast electrons formed by them in Compton scattering. In the following, the author discusses the method of investigation developed at the Fizicheskiy institut Akademii nauk SSSR (Physics Institute of the Academy of Sciences, USSR) (Ye. M. Brumberg, S. I. Vavilov), as well as the theory by Tamm and Frank, which is based on the assumption that the velocity of the electron moving in the medium is greater than that of

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light c/n in this medium. From all points through which the electron passes, electromagnetic excitation will propagate as delayed waves, which will be extinguished by interference in all directions with the exception of that for which $\cos\theta = 1/\beta n$. This important connection between θ, β and n could be experimentally proved (figure 2 shows the experimental arrangement, figure 3 - a photograph of the intensity distribution of radiations). Whereas ordinary luminescence has no asymmetry and appears on the photograph as a uniform, bright, closed ring, the radiation of particles moving with a velocity greater than that of light appears as part of this circle with two brightness maxima; the angle between them is 2θ. The figure shows this for pure H_2O and pure ethyl cinnamate. For each of the liquids 2 curves were obtained: the upper one for γ-rays of ThC", the lower one for such of Ra (Fig 4). It is easy to determine θ from the curves. θ is found to increase according to the theory with increasing refraction index n. In the following, the spectral investigation of this radiation is discussed (experimental scheme figure 5, photograph of the cross section of the

radiation cone figure 6; part of this cone is shown by a colored photograph (Fig 7); the photographs were taken by A. P. Zrelov of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)). The occurrence of Cherenkov radiation causes an energy loss of the electron, which is equal to $W = \frac{e^2 l}{c^2} \int_{\beta n>1} \omega \left(1 - \frac{1}{\beta^2 n^2}\right) d\omega$; l denotes the path length of the electron. In conclusion, there follow some discussions of the phenomena observed. Among other things, it is pointed out that in spite of the low intensity of the radiation at $\beta \cong 1$, 200-300 photons/cm are emitted by a particle moving through a medium with $n \cong 1.5$. There are 7 figures, 1 table, and 16 references, 6 of which are Soviet.

CSERENKOV, P.A. [Cherenkov, P.A.]; SZABO, Janos [translator]

Radiation of particles moving at higher speed than the velocity of of light and some fields of application of this radiation in experimental physics. Fiz szemle 10 no.1:13-18 Ja '60.

CHERENKOV, P.A.

PHASE I BOOK EXPLOITATION SOV/4393

Cherenkov, Pavel Alekseyevich, Professor, Igor' Yevgen'yevich Tamm, Academician, and Il'ya Mikhaylovich Frank, Corresponding Member, Academy of Sciences USSR

Nobelevskiye lektsii (Nobel Prize Papers) Moscow, Fizmatgiz, 1960. 73 p. 7,000 copies printed.

Ed.: T. V. Mikhalkevich; Tech. Ed.: Ye. A. Yermakova.

PURPOSE: This pamphlet is intended for physicists and researchers engaged in the application of the Cherenkov radiation principle in experimental physics.

COVERAGE: The pamphlet contains lectures by Professor P. A. Cherenkov, Academician I. Ye. Tamm, and Corresponding Member of the USSR Academy of Sciences I. M. Frank given in Stockholm on December 11, 1958 when receiving the Nobel Prize in physics. The supplementary article relates the history of the discovery of the Cherenkov radiation and presents biographical data on the three Nobel Prize re-

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cipients. Photographs of the prize winners are included in the booklet. The complete text of the speeches and of the article were previously published in Uspekhi fizicheskikh nauk, v. 67, no. 1, and v. 68, no. 3. The articles are accompanied by bibliographies listing Soviet and other technical literature.

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